THE IRON TRADE REVIEW

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Steel Corporation Enjoys Increase of Orders

After Filing of Suit, But Business in General is Depressed—Some Low Pig Iron Quotations—Improvement in Car Outlook

The hope long entertained that at least in the case of the country's greatest manufacturing company, any adjustment deemed necessary or desirable to conform to the anti-trust law would be made amicably, was shattered by the filing of the suit by the government against the United States Steel Corporation. This action will be taken as indicative that the government prefers to fight rather than co-operate. The filing of the suit has had a depressing effect on the markets throughout the country. A rather remarkable fact, however, is that since the filing of the suit, the Corporation itself has enjoyed a good increase in business in practically all lines except rails, for which the demand is very limited. In some quarters, there is a feeling that even such drastic action as that taken by the administration is better than continued uncertainty.

Structural Material

Structural material has had a full share of the gloomy feeling which has prevailed this week, but some important contracts have been placed. The Illinois Steel Co. will furnish 7,000 tons of plain material for the Field Memorial building in Chicago. This building was originally designed for Bethlehem sections. James Stewart & Co. have taken the general contract for a building in Denver, 4,000 tons. Bethlehem sections will be used in the addition to the Bureau of Printing and Engraving, Washington, 4,000 tons; also on the Otis Elevator building, Chicago, 2,500 tons. The Cambria Steel Co. has taken 2,500 tons for the Rice hotel, Houston, Texas. The McClintic-Marshall Construction Co. has 1,700 tons for additions to the New York Ship Building Co.'s plant, Camden, N. J. The American Bridge Co. has taken 2,500 tons for two buildings at Buenos Ayres, Argentine Republic, and 800 tons for the Citizens' Bank building, Tampa, Fla.

Railroad Buying

The first definite inquiry for rails for next year's delivery has come from a company which is asking for 25,000 tons, and a considerable increase in inquiry is expected at an early date. A Chilian railroad has placed 3,500 tons of rails with the United States Steel Products Co. The American Sheet & Tin Plate Co. has 1,200 tons of special galvanized sheets for South American railroads. The New York Central is reported to be considering the purchase of 5,000 additional freight cars. Domestic rail business is light. The rail mill at Sparrows Point, Md., has closed for lack of specifications. The Montreal Locomotive Works booked orders for 51 locomotives for the Canadian Railway Co. The American Bridge Co. has taken 700 tons for a bridge at Rochester for the Buffalo, Rochester & Pittsburgh railroad. The Rock Island has inquired for 500 ballast cars, 500 automobile cars, 250 freight cars and 25 cabooses. The B. & O. railroad is expected to close soon for 4,500 freight cars. The Grand Trunk has ordered 2,000 freight cars from the Pressed Steel Car Co. On the whole, the outlook for car business is more encouraging.

Pig Iron

Although pig iron made from ore hauled at the reduced rates, to become effective Nov. 30, on the Mesabi and Vermillion ranges cannot possibly appear for many months, and although practically all the pig iron to be used next year will be made from ore already shipped, the reduction in freight rates has had a depressing effect on the pig iron market. Very few sales have been made during the past few days. Sales of Bessemer have been made at $14.25, valley, a decline of 75 cents during the month. A Cleveland company having important ore and furnace interests has become a very aggressive seller of foundry pig iron and is selling as low as $12.75 for No. 2 at its Cleveland plant, for delivery into next year. The Pittsburgh Steel Co. has renewed its basic pig iron contract with W. P. Snyder & Co.

Bars and Pipe

A large tonnage of merchant bars for prompt shipment has been developed by low prices. One of the leading companies in the western Pennsylvania field reported that its mill orders for steel bars in October exceeded those of any single month this year, and with the exception of two months, were heavier than for any single month in 1910. There has been comparatively little buying for future delivery. There is increased activity in merchant pipe so far as specifications against contracts are concerned. The F. V. Smith Contracting Co. was low bidder for 7,000 tons of 48-inch cast iron pipe for a section of the Catskill aqueduct. The 9,200 tons awarded a contractor on another section of this aqueduct has not been allotted to foundries, which are bidding about $20 per ton, delivered. The reduction of $1 a ton in wire products is now general. The market for wire rods is weak.

WORLD'S IRON MARKETS

PITTSBURGH

Large Volume of Finished Material Changed Hands During Month.

Office of THE IRON TRADE REVIEW,
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So far the government suit to dissolve the United States Steel Corporation has had no serious effect upon general market conditions in this territory. While the filing of the suit was a distinct surprise to the trade, the more conservative manufacturers do not believe that the government attack will cause a further curtailment in demand for steel products or directly cause a further decline in prices. It is generally believed, however, that the filing of the suit at this time, when large buyers are figuring upon forward requirements, will result in consumers continuing the policy of buying only for urgent needs. Reports of local steel companies for October show that there is a large volume of business moving, due largely to low prices. The Carnegie Steel Co. reports that mill orders in its rail and semi-finished bureau in October exceeded those of any preceding month this year, with the exception of March. One of the largest manufacturers of steel bars reports that mill orders this month exceeded those of any month this year and with two exceptions were heavier than during any month in 1910. In plates, structural steel, sheets and wire products, new orders and specifications are only fair. The Pressed Steel Car Co. has received an order for 2,000 freight cars from the Grand Trunk railroad. The plates and other material will be rolled by the Carnegie Steel Co. The Cambria Steel Co. has taken a contract for 2,500 tons of steel for the Rice hotel, Houston, Tex., and the McClintic-Marshall Construction Co. received a contract for 1,700 tons for additions to the New York Ship Building Co.'s plant. The first definite inquiry for steel rails for 1912 calls for 25,000 tons. Other trunk lines are expected to put out formal inquiries early in November. Small lots of Bessemer pig iron have sold at the lowest price in years. The Canadian Pacific has ordered 1,000 tons of boiler tubes and there has been additional buying of line pipe. Sales of furnace coke involve about 19,000 tons. Some tentative inquiries have been put out for 1912 delivery.

Pig Iron.—While consumers continue to buy quietly in small lots to cover urgent needs, investigation shows that a larger amount of pig iron has changed hands than reported from time to time. The cancellation of the Great Northern ore lease by the United States Steel Corporation and the reduction in iron ore freight rates to open lake ports have had a disturbing effect upon the local pig iron market and some consumers, who were quietly negotiating for forward requirements, apparently have decided to continue the policy of buying from month to month. Practically all consumers continue to take shipments against contracts in a satisfactory manner and there has been a further decline in stocks in furnace yards during the week. Among the important developments of this market during the week were the two sales of small lots of Bessemer at the lowest price in years. One lot of 200 tons was sold at $14.30, valley, and the other lot of 100 tons was sold at $14.25, valley, which represents a decline of 75 cents a ton during the past month. These sales, however, were not large enough to establish a market and the leading valley furnaces continue to quote $14.50, valley, as the general asking price. Additional sales of malleable aggregating 2,500 tons have been made at current prices and there is approximately 2,000 tons under negotiation. There has been no trading of importance in the basic market and sellers continue to ask $12.50, valley, for prompt and forward delivery. Odd lots of No. 2 foundry have been sold on a basis of $13.25 to $13.50, valley. Two inquiries involving about 600 tons each are pending. We quote the market as follows:

(Prompt Shipment.)

Bessemer, valley	$14.25
Bessemer, Pittsburgh	15.15
Basic, valley	12.50
Basic, Pittsburgh	13.40
No. 2 foundry, Pittsburgh	14.15
Gray forge, Pittsburgh	13.65
Malleable, Pittsburgh	13.40

(Fourth Quarter.)

Bessemer, valley	$14.50
Bessemer, Pittsburgh	15.40
Basic, valley	12.50
Basic, Pittsburgh	13.40
No. 2 foundry, Pittsburgh	14.40
Gray forge, Pittsburgh	13.65
Malleable, Pittsburgh	13.65

Ferro-Alloys.—Consumers are slow in closing on inquiries for ferro-manganese noted recently. Carload lots for prompt shipment have been sold at $37.25, Baltimore, and this figure is now quoted as the minimum, while on material for forward delivery the general asking price is $38.50, seaboard. Inquiry for foreign and domestic ferro-silicon is light.

We quote ferro-manganese at $37 to $37.25 Baltimore, for prompt shipment, and at $38 to $38.50, Baltimore, for forward delivery. The freight rate from Baltimore to Pittsburgh is $1.95 per ton.

Fifty per cent ferro-silicon is quoted at $59 to $60, Pittsburgh, for prompt and forward delivery; 12 per cent, $24; 11 per cent, $23; 10 per cent, $22, f. o. b. Jackson, Jisco and Ashland furnaces. The freight rate to Pittsburgh is $1.90. The foreign grades are held at $1 or more a ton over domestic prices.

Plates. — Local manufacturers of plates are receiving a fair run of specifications against contracts from tank builders, and car builders are specifying a little more freely, but the market generally is quiet and keen competition is developing some low prices. The Pressed Steel Car Co. has received an order for 2,000 freight cars of various types from the Grand Trunk railroad, the plates and other material to be furnished by the Carnegie Steel Co. While there is considerable disappointment regarding the attitude of the railroads with regard to inquiries for freight cars, which have been pending for some time, it is stated that prospects for future car buying are more encouraging and it is expected that the Baltimore & Ohio railroad will close on its inquiry for 4,500 freight cars early in November. About 9,400 tons of plates will be required for the Los Angeles, Cal., aqueduct, on which bids will open about the middle of November. Prices are weaker and 1.15c, Pittsburgh, is now quite general. This figure has been shaded on particularly desirable business. We quote the market as follows:

Tank plates, ¼ inch thick, 6¼ to 100 inches, 1.15c to 1.20c. Extras are as follows, per 100 pounds: Boiler and flange steel plates, 0.10c; A. B. M. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.30c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches excepting straight taper plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches, 0.10c; circles, 0.20c. Plates in widths over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125

inches up to 130 inches, 0.50c; over 130 inches, 1c. Gages under ¼ inch to and including ⅜-inch plate on thin edge, 0.10c; under ⅜ and including No. 9, 0.25c. Five cents extra for less than carloads. Terms net cash in 30 days.

Sheets.—The feeling that prices on sheets have reached bottom is pretty general and some of the larger buyers have made firm offers to contract as far ahead as possible at today's price level. Manufacturers, however, contend that present prices are near the cost line and are not disposed to accept contracts for forward delivery at the minimum prices established during the past few weeks. A few contracts for the first half of next year have been made, but the tonnage involved is not very heavy. New business and specifications in October compare favorably with those of last month. The price situation shows little change. Sales are being made regularly by some mills on a basis of 1.85c on black sheets No. 28 gage, and 2.85c, Pittsburgh, on galvanized sheets, No. 28 gage. We quote the market as follows, with $1 a ton added as the delivered price in the Pittsburgh district:

Blue annealed sheets No. 10 gage, 1.40c; black annealed sheets No. 28 gage, 1.85c to 1.90c; galvanized sheets, No. 28 gage, 2.85c to 2.90c; painted roofing sheets, $1.30 per square for No. 28 gage, 2½-inch corrugation; galvanized roofing sheets, $2.50 per square for No. 28 gage, 2½-inch corrugation f. o. b. Pittsburgh.

Tin Plate.—Some fairly large contracts for tin plate for delivery in 1912 have been made with independent manufacturers and the leading interest since the price was reduced $2 a ton a few weeks ago, but there has been no rush on the part of buyers to contract for next year's requirements. Both buyers and sellers regard the new quotation of $3.40, Pittsburgh, on 14 x 20 100-pound cokes as being very low, but there is no indication that prices will be advanced in the very near future. As far as delivery this year is concerned, there is very little new business being booked and specifications are light, with the result that fewer mills are operating at present than for some time. We quote the market as follows:

Coke tin plate, 100-pound basis, 14 x 20, $3.40 f. o. b. mill, Pittsburgh district.

Rails and Track Material.—The first definite inquiry sent out by any of the trunk lines for standard steel rails for 1912 delivery calls for 25,000 tons. It is expected that this road will place contracts within the next 10 days. As stated recently, several other large roads, including the Pennsylvania and New York Central, are expected to put out definite inquiries in the very near future. No important contracts for standard rails were placed in this market during the past week, but there has been a fair run of small orders for immediate rolling. There has also been a good run of orders for light rails and shipments for export have been fair. We quote the market as follows, the base price on open-hearth rails being 1.34c per pound at the mill:

Fifty-pound and heavier, 1.25c per pound; carloads and less than 500 tons, 1.34c per pound; light rails on base weight of 40 to 45 pounds, 1.16c, the schedule on the other weights being irregular and subject to negotiations; angle splice bars for standard sections, 1.50c, Pittsburgh; track bolts, 2.20c to 2.25c, Pittsburgh.

Railroad Spikes.

4½, 5 and 5½ and 9/16	$1.40
3, 3½, 4, 4½ and 5 x ½	.10
3½, 4 and 4½ x ⅞	.20
3, 3½, 4 and 4½ x ⅝	.30
2½ x ⅝	.40
2½, 3 and 3½ x ⅝	.60
2 x ⅝	.80

Steel.—Liberal specifications against contracts for semi-finished steel have been sent in by the larger consumers for November shipment. The leading interest reports that, with the exception of March, mill orders in its rail and crude steel department in October exceeded those of any other month this year. Firm offers are still being made by consumers to contract for their full requirements of billets and sheet bars over the first half of next year at today's price level, but makers are not anxious to contract so far ahead. Some mills will not quote under $19.50 for open-hearth billets and $20.50 for open-hearth sheet bars, f. o. b. Pittsburgh or Youngstown, although a few of the smaller mills are understood to be shading these figures. We quote the market as follows:

Bessemer 4 x 4 billets with 0.25 carbon and less are quoted at $20, with the usual extras for size and analysis, and open-hearth rolling billets, $19 to $19.50; Bessemer sheet and tin bars are quoted at $21, and open-hearth sheet bars are quoted at $20 to $20.50, f. o. b. Pittsburgh or Youngstown, with full freight to destination added. Forging billets are quoted at $24 to $24.50 Pittsburgh.

Structural.—The Cambria Steel Co., Johnstown, Pa., has received a contract for 2,500 tons of structural steel work in connection with the building of the Rice hotel, Houston, Tex. The McClintic-Marshall Construction Co. has taken about 1,700 tons for additions to the New York Ship Building Co.'s plant, Camden, N. J. A number of small bridge contracts were awarded during the past week, and, while one or two independent companies in this territory have a fair amount of business on their books, competition is very keen and some low prices are being quoted. We quote the market as follows:

Beams and channels, 15 inches and under, 1.20c; over 15 inches, 1.35c; zees, 1.25c; tees, 1.30c; angles, from 3 to 6 inches, 1.25c; over 6 inches, 1.35c; universal and sheared plates, 6¼ inches wide and wider, 1.25c.

Hoops and Bands. — New business and specifications for hoops and bands are unsatisfactory and prices are not very firm. We quote the market as follows:

Hoops in carload lots, 1.35c, Pittsburgh; in less than carload lots, 1.45c; bands, 1.10c to 1.25c, base, with net extras, as per standard steel.

Merchant Bars.—That low prices on steel bars have developed much heavier tonnage for immediate shipment is shown by the report of one of the leading companies in the western Pennsylvania field that mill orders for steel bars in October exceeded those of any single month this year, and, with two exceptions, were heavier than for any single month in 1910. There has been comparatively little buying for forward delivery and investigation shows that only a small portion of the tonnage shipped by this company in October was used to replenish depleted stocks. Shipments were well scattered and the general run of orders for prompt shipment shows a decided gain. The quotation of 1.10c, Pittsburgh, is quite general and this price has been shaded on desirable business. Demand for bar iron is light and prices are only fairly firm. Specifications against contracts for shafting are more encouraging, although there has been little improvement in the price situation. We quote the market as follows:

Common iron bars, 1.20c, Pittsburgh; Bessemer and open-hearth steel bars, 1.10c to 1.15c plow and cultivator, 1.20c; channels, angles, zees, tees, under 3 inch, 1.25c, all f. o. b. mill. The following differentials are maintained on steel. Less than 2,000 pounds of a size, 0.35c advance. Cold rolled and ground shafting, 60 and 5 per cent to 60 and 10 per cent off in carloads and 57 per cent in less than carloads, delivered in base territory.

Muck Bar.—This market continues quiet with no important sales and little inquiry. We quote muck bar nominally at $28, Pittsburgh, with a premium of $1 a ton for all pig iron muck bar.

Merchant Pipe.—Increased activity is noted in the market on pipe in the way of specifications against contracts for merchant iron and steel pipe and small orders for line pipe. The Tri-County Natural Gas Co. has awarded a contract to the Mark Mfg. Co. for seven miles of 10-inch steel line pipe

for immediate shipment. An Ohio gas interest has ordered six miles of 6 and 8-inch steel line pipe from an independent company. The High Grade Oil Co., Butler county, Pa., has placed an order with an independent mill for 21 miles of 3-inch and 18 miles of 2-inch steel line pipe. It is stated that the Texas Co., which recently placed an order with the Republic Iron & Steel Co. for 150 miles of 6-inch steel line pipe, is figuring on 250 miles of various sizes of steel pipe. No action has been taken as yet on the inquiry for 250 miles of line pipe for a western interest noted a few weeks ago. Jobbers are specifying more liberally against contracts for merchant pipe and the new discounts are being maintained. We quote the following official discounts in carload lots, subject to the usual preferential discount to the larger buyers, merchant pipe, where specified, being offered in from ⅛ to 6 inches:

Iron and Steel Pipe Basing Prices.

	Steel.		Iron.	
	Butt weld.			
	Black.	Galv.	Black.	Galv.
⅛, ¼ inch	73	53	68	48
⅜ inch	74	64	69	59
½ inch	77	67	72	62
¾ to 1½ inch	80	72	75	67
2 to 3 inches	81	74	76	69
	Lap weld.			
2 inches	77	70	72	65
2½ to 4 inches	79	72	74	67
4½ to 6 inches	78	70	73	65
7 to 12 inches	76	66	71	61
13 to 15 inches	..	..	47	..
Extra Strong, Plain Ends.				
	Butt weld.			
⅜, ¼, ½ inch	70	60	65	55
½ inch	75	69	70	64
¾ to 1½ inch	79	73	74	68
2 to 3 inches	80	74	75	69
Extra Strong, Plain Ends.				
	Lap weld.			
2 inches	76	70	71	65
2½ to 4 inches	78	72	73	67
4½ to 6 inches	77	71	72	66
7 to 8 inches	70	60	65	55
9 to 12 inches	65	55	60	50
Double Extra Strong, Plain Ends.				
	Butt weld.			
½ inch	65	59	60	54
¾ to 1½ inch	68	62	63	57
2 to 3 inches	70	64	65	59
Double Extra Strong, Plain Ends.				
	Lap weld.			
2 inches	66	60	61	55
2½ to 4 inches	68	62	63	57
4½ to 6 inches	67	61	62	56
7 to 8 inches	60	50	55	45

Plugged and reamed pipe is furnished at 2 points higher price, either butt or lap weld.

Boiler Tubes.—Some of the railroads are buying boiler tubes more liberally, although the market as a whole is quiet. The Canadian Pacific railroad has placed an order with the National Tube Co., for 1,000 tons of boiler tubes. We quote the official discounts on steel boiler tubes in carload lots as follows:

1¼ to 2¼ inch	65
2½ inch	67½
2¾ to 3¼ inch	72
3½ to 4½ inch	75
5 and 6 inch	67½
7 to 13 inch	65

To destination east of Mississippi river will be sold at delivered discount for carloads lowered by 2 points, for lengths 22 feet and under; longer lengths, f. o. b. Pittsburgh. Usual extras to jobbers and boiler manufacturers.

Wire Products.—The reduction of $1 a ton in prices of wire products is now general and some mills have taken contracts for plain wire at $1.40, Pittsburgh, for delivery to the manufacturing trade over the first quarter of 1912. On wire nails local companies are quoting $1.60, Pittsburgh, for delivery only over the next 60 days. Despite the fact that there has been a fair amount of buying during the past 30 days, the actual demand is considerably under the capacity of the mills. There is little demand for cut nails. We quote the market as follows:

Wire nails, jobbers, carload lots, $1.60 to $1.65; retailers' carload lots, $1.65 to $1.70; cut nails (western makers), jobbers' carload lots, $1.55; painted barb wire, jobbers' carload lots, $1.60 to $1.65; retailers' carload lots, $1.70, with 30c for galvanizing; plain wire to jobbers in carloads, $1.40 to $1.45, and to dealers, in carloads, $1.45 to $1.50; polished staples, $1.60; galvanized staples, $1.90.

Wire Rods.—This market is weak in sympathy with the market on wire products, and, while no important sales have been openly reported below $26, Pittsburgh, this figure has been shaded. We quote $25.50 to $26, Pittsburgh, on Bessemer and open-hearth wire rods.

Coke.—Several of the larger consumers of furnace coke have put out tentative inquiries for their 1912 requirements, although no important contracts have been placed for delivery beyond this year. We note a sale of 15,000 tons of furnace coke for delivery during November and December at about $1.60, ovens, and scattered sales aggregating about 4,000 tons for prompt shipment at about $1.50, ovens. Practically all consumers of both furnace and foundry coke are taking shipments in a very satisfactory manner and some buyers who previously covered by contract have bought small lots in the open market. The Clinton Iron & Steel Co. is taking shipments against its contract made recently and will blow in its furnace the latter part of this week. Production in the Connellsville region shows little change, as compared with the preceding week, while shipments increased about 300 cars. It is estimated that the H. C. Frick Coke Co. loaded and consigned about 10,000 tons of coke this week. We quote, standard Connellsville furnace coke for prompt shipment at $1.50, ovens, and for delivery over the next two months at $1.55 to $1.60, ovens. On high grade Connellsville foundry coke, we quote, from $1.90 to $2, ovens, for prompt shipment and from $2 to $2.40, ovens, for future delivery. The Connellsville *Courier's* figures for the week ending Oct. 21 show 26,261 active ovens with an output of 310,766 tons, as compared with 26,166 active ovens and a production of 310,205 tons the previous week.

Old Material.—Old material is moving a little more freely in this territory. Some of the large consumers are again taking shipments against contracts in a satisfactory manner and there has been some buying in comparatively small lots. Sales of heavy melting steel during the past week aggregate upward of 4,000 tons. The material was sold on a basis of $12, delivered, and about 3,000 tons went to one consumer in the Youngstown territory. Prices apparently are no weaker than 10 days ago. Practically all of the railroads in this territory will put out their usual monthly scrap list the latter part of this week and the indications are that a large amount of material will be offered, as it is understood that some of the railroads did not dispose of their entire holdings a month ago on account of low prices offered. We quote, gross tons, delivered in the Pittsburgh district, including Monessen, Sharon, Steubenville, Brackenridge and Folfansbee as follows:

Heavy melting scrap	$12.00 to 12.25
Rerolling rails	12.50 to 13.00
Malleable	11.50 to 12.00
Bundled sheet scrap	10.00 to 10.50
Iron axles	22.00 to 23.00
Old iron rails	14.50 to 15.00
Stove plate	9.00 to 9.50
No. 1 wrought scrap	12.50 to 13.00
Old car wheels	12.25 to 12.75
Low phosphorus	14.50 to 15.00
Machine shop turnings	8.75 to 9.00
Cast borings	8.00 to 8.50
No. 1 cast scrap	12.50 to 12.75

CHICAGO

Government Suit Has Depressing Effect in This Market.

Office of THE IRON TRADE REVIEW,
1328 Monadnock Block, Oct. 31.

The government suit against the United States Steel Corporation seems to have shocked the market in the west into a temporary condition of numbness and apathy. It is conceded, however, on all sides that the recent action can have but little permanent effect on either the volume of business or prices, both being practically

at a minimum. The adverse effect of the steel suit is largely sentimental.

It is expected, however, on account of the additional uncertainty injected into the situation by the government's action, that any extensive buying for future requirements will be further postponed. Under present conditions, buyers see no reason why prices should advance materially within the next few months and are, therefore, taking a conservative attitude.

The volume of business remains moderately good, although manufacturers of sheets and some lighter lines find it increasingly difficult to maintain their mill operations.

Pig Iron.—Buyers are showing a marked tendency to hold off and a number of important deals which have been pending in this market for some time remain closed. Aside from the additional caution noted in the trade, the situation shows little change from that which has prevailed since the close of summer. Buyers are taking northern iron according to their current needs, without much disposition to look into the future. Up to date, although the season is well advanced, there has been but very little southern iron sold for first half shipment. Although the pressure on the charcoal market is somewhat less at present than formerly, because certain large furnace interests have cleaned up their heavy stocks, lack of demand prevents any hardening of prices. In fact the Chicago market for Lake Superior charcoal may now be fairly quoted at $16.50.

The following prices represent the market for Chicago delivery, except northern foundry No. 2 and malleable Bessemer made in local furnaces, which is quoted f. o. b. furnace:

(Shipment this year.)

Lake Superior charcoal	$16.50
Northern foundry No. 2	14.50
Southern foundry No. 2	14.35
Southern silveries, 5 per cent silicon	15.60
Jackson Co. silveries, 8 per cent	17.40
Malleable Bessemer	14.50
Alabama basic	14.35

Billets.—There is a fair volume of small orders but the market presents no new features. Under present price conditions makers are not urging buyers to come into the market for their future requirements. We quote, open-hearth forging billets, $25 to $26; rerolling billets, $22, Chicago.

Merchant Bars.—Local mills manufacturing bar iron have increased their rolling schedules slightly but it is not felt that this presages any particular improvement in the trade. Prices of bar iron remain low and show no strength. Steel bars are firmly established in this market on a basis of 1.28c, base, Chicago, with occasional sales at 1.25c where the buyer is in a position to offer attractive specifications. The demand for shafting is moderately heavy and prices out of stock are steady.

We quote, Chicago delivery, as follows:

Bar iron, 1.17½c to 1.23c; hard steel bars, rerolled, 1.18c to 1.23c; soft steel bars and bands and small shapes, 1.28c to 1.33c, base; hoops, 1.53c to 1.58c; smooth finished machinery steel, 1 inch and larger, 1.78c. Shafting 60 per cent off list for carload lots, 57 per cent off for less.

On iron and steel from local stock, we quote, as follows:

Bar iron, 1.55c to 1.65c per pound base; soft steel bars, 1.55c to 1.65c per pound base; soft steel hoops, 1.80c to 1.90c, full extras.

Structural Material.—The price of plain material remains fairly firm at 1.33c to 1.38c, Chicago. Structurals are showing a little more strength than plates, largely because they are less affected by severe competition from eastern points. Plans for the new Field Museum have been revised and the structural steel requirements cut from 10,000 to 6,929 tons. This contract has now been formally let to Hansell-Elcock Co., Chicago, and Illinois Steel Co. will supply material. The Otis Elevator Co. has let a warehouse for erection in Chicago, 2,500 tons, to the Vierling Steel Co. The McClintic-Marshall Construction Co. has taken 650 tons for an addition to the Michigan Trust building at Grand Rapids, Mich. No award has been made yet on the McClurg building, which will require about 1,000 tons.

We quote, structural material, f. o. b. Chicago, as follows:

Beams and channels, 15 inches and under, 1.33c to 1.38c. For extras, see Pittsburgh report.

Plain material out of store is as follows:

All angles, 3 inches and larger, including 6 inches, $1.65 to $1.75 per 100 pounds; angles over 6 inches, $1.75 to $1.80 per 100 pounds, base; beams, 3 to 15 inches, inclusive, $1.65 per 100 pounds, base; channels, 3 inches and larger, $1.65 per 100 pounds, base.

Rails and Track Fastenings.—Specifications for track fastenings are extremely light and the market is showing some weakness. Some sales of spikes have been made at 1.58c, although the general level of prices is nearer 1.60c. Track bolts with square nuts are now quoted 2c, f. o. b. Joliet. There have been no developments during the week of interest in the standard rail market. Some western roads continue to display a tentative interest in their 1912 requirements.

We quote, light rails, f. o. b. Chicago and track fastenings, f. o. b. Joliet, as follows:

Light rails, carloads, 40 to 45-pound, 1.16c to 1.20½c; 30 to 35-pound, 1.19½c to 1.24c; 16, 20 and 25-pound, 1.20½c to 1.25c; 12-pound, 1.25c to 1.29½c.

Light section relayers, 45 pounds and under, subject to inspection, $21 to $23; standard section relaying rails, subject to inspection, $23.50 to $24.

Track fastenings, f. o. b. Joliet, angle bars, 1.50c; railroad spikes, 1.60c, smaller size spikes, 1.70c, base; track bolts with square nuts, 2.00c base.

Plates.—On account of fairly liberal specifications from car buildings, western plate mills are in an extremely satisfactory condition as regards tonnage now on the books. Nevertheless competition from outside points is so severe that prices have no buoyancy in the local market. The Chicago, Rock Island & Pacific is making inquiries for 500 Rodger ballast cars; 500 automobile cars; 250 freight cars and 25 cabooses. The Algoma Central & Hudson Bay Railroad is in the market for 50 box cars and 12 passenger coaches. The Woodward Iron Co., Woodward, Ala., is considering the purchase of from 50 to 100 coke cars.

We quote, mill prices, f. o. b. Chicago, as follows:

Tank plates, ¼ inch thick, 6¼ to 100 inches wide, 1.33c to 1.38c. For extras, see Pittsburgh report.

Store prices are as follows:

Tank steel, ¼ inch and heavier, up to 72 inches wide, 1.65c.

Sheets.—The local mill is operating about 80 per cent of its capacity and sheet makers find that business is coming out with greater reluctance. While mill quotations in the Chicago market are nominally unchanged at 2.08c for No. 28 black and 3.08c for No. 28 galvanized, concessions of $1 a ton are allowed for attractive business. Buyers have very little interest in their future requirements.

We quote store prices, f. o. b., Chicago, as follows:

For mill prices, see Pittsburgh report. Freight to Chicago, 18 cents.

Blue annealed, No. 10, 1.95c; No. 12, 2.05c. Box annealed, No. 28, 2.40c. Galvanized, No. 28, 3.35c.

Wire Products.—Conditions in the wire trade show very little change. The volume of orders from agricultural sections continues to be encouraging, while industrial business is slow in common with other lines. Prices in the west are being fairly well maintained, although in some cases on attractive business sales of wire nails have been made on a basis of 1.60c, Pittsburgh, and other products in pro-

portion. This, however, can hardly be considered to reflect general market conditions in the west at the present time, which are more correctly represented by the price of 1.83c, Chicago.

We quote, f. o. b. Chicago, as follows:

Wire nails, jobbers, carload lots, $1.83; retailers' carload lots, $1.88; retailers' less than carload lots, $1.98; painted barb wire, jobbers' carload lots, $1.83; retailers' carload lots, $1.88; retailers', less than carload lots, $1.98, with 30c for galvanizing; plain wire to jobbers, $1.63; plain wire, retailers' carload lots, $1.68.

Merchant Pipe and Tubes.—Building operations in general are very satisfactory in this territory, which is having a good effect on the demand for the more common sizes of merchant pipe. Jobbers are specifying more liberally against contracts as a consequence. New business in tubes is unsatisfactory and the market is only moderately active. Prices continue to be somewhat irregular.

We quote, merchant pipe and tubes, f. o. b. Chicago, as follows:

Iron and Steel Pipe Basing Prices.

	Steel.		Iron.	
	Black.	Galv.	Black.	Galv.
⅛-¼ inch	70.2	49.2	63.2	41.2
⅜ inch	74.2	63.2	66.2	56.2
2 in. to 3 in.	78.2	70.2	72.2	64.2
4½-6 inches	75.2	66.2	69.2	60.2
7-12 inches	72.2	61.2	67.2	56.2
Extra Strong Plain Ends.				
½ inch	71.2	64.2	54.2	52.2
2-3 inches	76.2	69.2	61.2	55.2
7-8 inches	66.2	55.2	59.2	47.2
Double Extra Strong.				
½ inch	59.2	51.2	....	....
2-3 inches	64.2	56.2	....	....
7-8 inches	54.2	42.2	....	....

Tubes.

	Lap weld steel.	Charcoal iron.	Shelby seamless.
	Per cent.	Per cent.	Per cent.
1 inch	39	..	57½
1¼ to 2¼ inch	55	40	35
2¾ to 3¼ inch	65	50	46
3½ to 4½ inch	67½	50	46
5 to 6 inch	55	..	..

Cast Iron Pipe.—All bids have been rejected by the city of Muskegon, Mich., on 2,500 tons of water pipe which was to have been awarded last week. New specifications have been issued and new bids will be opened Nov. 6. Routine pipe business is fair. Makers expect a moderate amount of new tonnage through the winter.

We quote, f. o. b. Chicago, as follows:

Four-inch water pipe, $26.50; 6 to 12 inches, $24.50, larger sizes, $24; gas pipe, $1 a ton higher.

Old Material.—The pressure on the scrap market shows no decrease and prices of various items continue to yield. Lower prices are noted for old steel rails, which, in lengths of 5 feet and over have been sold down to $12, Chicago, while rails 3 feet and under are now quoted $11 to $11.50 per gross ton. Heavy melting steel has dropped below $10 for the first time in a long period. Shafting, which has been one of the noticeably weak items, has declined an additional 50 cents a ton and a similar decrease is noted in the price of iron car axles. Railroad scrap is generally weak. Steel angle bars sold last week at $8.75, Chicago.

We quote, for delivery in consumers' yards, Chicago, as follows:

GROSS TONS.

Old car wheels	$12.00 to 12.50
Old iron rails	14.50 to 15.00
Rerolling rails (5 ft. and over)	12.00 to 12.50
Old steel rails (3 ft. and under)	11.00 to 11.50
Frogs, switches and guards	10.00 to 10.50
Heavy melting steel	9.75 to 10.25
Shoveling steel	9.25 to 9.75

NET TONS.

No. 1 R. R. wrought	$10.00 to 10.50
No. 2 R. R. wrought	9.00 to 9.50
Arch bars and transoms	13.50 to 14.00
Knuckles, couplers and springs	10.00 to 10.50
Shafting	13.50 to 14.00
Iron car axles	16.75 to 17.25
Steel car axles	15.50 to 16.00
Locomotive tires	14.00 to 15.00
Dealers' forge	9.25 to 9.75
Pipe and flues	7.00 to 7.50
No. 1 cast	10.50 to 11.00
No. 1 busheling	8.00 to 8.50
No. 2 busheling	6.00 to 6.50
No. 1 boiler cut	7.00 to 7.50
Boiler punchings	12.50 to 13.00
Cast and mixed borings	5.00 to 5.25
Machine shop turnings	6.00 to 6.50
Railroad malleable	9.50 to 10.00
Agricultural malleable	9.25 to 9.75
Angle bars, splices, etc., iron	12.00 to 12.50
Angle bars, steel	8.75 to 9.25
Stove plate and light cast scrap	9.25 to 9.75

CLEVELAND

More Lively Pig Iron Inquiry Than in Months.

Office of THE IRON TRADE REVIEW, Penton Building, Oct. 31.

Iron Ore.—The market is in a chaotic condition as no one has any definite idea as to how prices will be readjusted under the new freight rates which will become effective in the Mesabi and Vermillion ranges about Nov. 30. The shipping season lags at the close and boats are gradually being withdrawn from commission.

On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, we quote as follows: Old range Bessemer, $4.50; Mesabi Bessemer, $4.25; old range non-Bessemer, $3.70; Mesabi non-Bessemer, $3.50.

Pig Iron.—Developments of the past few days indicate that the pig iron market in Cleveland for the first half of next year will be on a considerably lower plane than at present. One firm has become very aggressive and is selling at $12.75, furnace, or $13, delivered at Cleveland foundries, which is 75 cents below the recent selling price. One buyer who is in the market for 500 tons for shipment to southern Ohio, has developed a price of about $12.75, Cleveland furnace. One large agency reports that while its shipments are unusually heavy, its sales are light, indicating good consumption but unwillingness of buyers to commit themselves for the future. A northern Ohio buyer of off grades is quietly inquiring for several thousand tons. We quote, delivered in Cleveland, for the remainder of the year and the first half of next year, as follows:

No. 1 foundry	$13.50 to 13.75
No. 2 foundry	13.00 to 13.25
No. 2 southern	14.35
Gray forge	12.50
Bessemer	15.15
Lake Superior charcoal	17.00
Jackson Co. 8 per cent silvery	17.05

Coke.—Considerable increase in buying has developed and in contracting for foundry coke for the first half of next year and prices represent a rather wide range, Rainey coke commanding as high as $2.35 for delivery up to July 1, and other cokes can be had at $1.90 for prompt and $2.15 for first half. We quote:

Connellsville furnace coke, $1.50 to $1.55 for prompt delivery, and $1.60 for last quarter; Connellsville foundry coke, $1.90 to $2.35 for prompt, and $2.15 to $2.35 for first quarter.

Finished Material.—Very few structural contracts of any importance are pending. Temporary sketches of the Eagle school building have been completed and bids will probably be called for for steel within a week or two. A storage plant will be erected by the Fireproof Storage Co. that will require 140 tons of reinforcing bars. The contract will be let this week. The reports of extremely low prices on finished material are heard, but often these are found to be due to sales made in Chicago and other manufacturing points, distant from Pittsburgh, the consumers disregarding Pittsburgh as the basing point. Hence the prices actually netted to the mills are not as small as they seem. Reports are heard of 1.10c, Pittsburgh, being shaded on steel bars, but one large producer will not sell at less than 1.15c. Nut and bolt manufacturers are very busy but prices for their products are low.

Old Material.—Recent railroad offerings of heavy melting steel in this locality have brought slightly better prices than in several months, the Nickel Plate list of several hundred tons closing at $12.50, delivered to an out-of-town concern. It is understood that the Lake Shore has practically cleaned up its yards at Collinwood, Elkhart and Chicago. At the same time, local consumers of heavy steel have secured fair sized

tonnages into next year at $11, several lots approaching 1,000 tons being bought at that price for delivery in January, February and March. We quote, gross tons, f. o. b. Cleveland, as follows:

Old iron rails	$14.00 to 14.50
Old steel rails (under 6 ft.)	12.00 to 13.00
Old steel rails (over 6 ft.)	12.75 to 13.00
Relaying rails	20.00 to 21.00
Old car wheels	12.00 to 12.50
Old steel boiler plate	9.50 to 10.00
Malleable iron (railroad)	11.50 to 12.00
Steel axles	18.00 to 18.50
Axle turnings	8.50 to 9.00
Malleable iron (agricultural)	10.75 to 11.25
Heavy steel	11.00 to 11.50
Country mixed steel	9.00 to 9.50

We quote, net tons, as follows:

No. 1 R. R. wrought	$11.00 to 11.50
No. 1 busheling	9.00 to 9.50
No. 1 machine cast	11.00 to 11.50
No. 1 dealers' wrought	10.00 to 10.50
Machine shop turnings	6.50 to 6.75
Pipes and flues	8.50 to 9.00
Wrought drillings	6.50 to 6.75
Stove plate	9.00 to 9.50
Cast borings	6.00 to 6.50
Wrought iron piling plate	15.00 to 15.50
Wrought iron arch bars	15.50 to 16.00

CINCINNATI

Despite Government Shock, Pig Iron Has Brighter Aspect.

Office of THE IRON TRADE REVIEW, 808 Provident Bank Bldg., Oct. 31.

Pig Iron. — Notwithstanding the shock given the past week to general business, the tone of the local pig iron market has assumed a somewhat brighter aspect, and the business transacted while not large has been sufficient to cause a better feeling to exist among selling agencies. Many small inquiries ranging from a car load to several hundred ton lots have been received, and the result has been a number of sales of limited character. As a general proposition it may be stated that a majority of the southern producers have gradually and quietly accepted the situation and have come to the $10 basis for any delivery up to and including the first half of next year. This may not in all cases be an open quotation, yet it is conceded by most of the selling agencies, that if necessary to make this concession to secure the business it can be done. It looks as if the larger buyers had determined to hold off purchasing for next year's requirements until later, trusting that later developments would be in their favor. However, there appears to be enough iron needed for prompt requirements to keep a fair tonnage moving, and allow future developments to take care of themselves. A few scattering sales have been made of the higher grades of silvery, and some sale of special and charcoal irons. It is also said that several of the cast iron interests are expected to come into the market for round blocks of lower grades, contingent upon contracts now pending. The indications are that northern iron has settled to $13 for this year and through the first half of next, although some of the furnaces in this region are still holding for $13.50 for the latter period. One large melter in Ohio closed for 1,000 tons of southern foundry grades, and a pipe concern of Virginia bought an indefinite tonnage of low grades. A local concern bought 500 tons of southern foundry at prevailing quotations. Freight rates from Birmingham $3.25 and from Ironton $1.20. We quote as follows:

Southern foundry No. 2	13.25 to 13.50
Southern foundry No. 3	12.75 to 13.25
Southern foundry No. 4	12.50 to 12.75
Southern gray forge	12.50 to 12.75
Mottled	12.25 to 12.50
Southern No. 1 soft	14.70 to 15.20
Southern No. 2 soft	14.20 to 14.70
Standard southern car wheel	25.50
Northern No. 2 foundry	14.20
Northern No. 3 foundry	13.70
Northern No. 4 foundry	13.20
Jackson county 8 per cent silicon	16.95

Coke.—No sales of importance were noted the past week, transactions reported being more or less of a routine nature and in the way of prompt requirements. Contract shipments are being moved in a fairly satisfactory manner, indicating that the melt continues to be in the neighborhood of normal. Prices are unchanged and from the leading coke producing districts are as follows:

	Prompt shipment.	Contract second half.
Connellsville district:		
Foundry coke	$2.00 to 2.25	$2.00 to 2.40
Furnace coke	1.55 to 1.65	1.75 to 1.90
Wise county district:		
Foundry coke	2.00 to 2.25	2.00 to 2.25
Furnace coke	1.75 to 2.00	*Sliding [scale basis.
Pocahontas district:		
Foundry coke	2.00 to 2.10	2.00 to 2.10
Furnace coke	1.50 to 1.75	1.60 to 1.75
New river		
Foundry coke	2.50 to 3.15	2.60 to 3.25
Furnace coke	2.10 to 2.15	2.10 to 2.20

*Sliding scale basis means $1.60 for coke based on $9, Birmingham, for pig iron, with an advance of 16⅔ per cent of the amount over $9 at which pig iron is quoted. This is the usual basis. Other forms of sliding contracts are also made.

Finished Material. — The price of steel bars has gradually settled until 1.10c, Pittsburgh, is said to be the figure at which the bulk of contracting has been done. Structural demand is quiet and featureless. Locally considered, the one or two projects that are now under way that will call for fabricated material have not proceeded to the extent that a definite figure can be given.

Old Material.—Dealers continue to pile iron to some extent, and sales are said to be light and of small importance. Offerings during the week have perhaps been below the average, and the market generally is quiet and inactive. Prices so far as can be ascertained are unchanged, yet are no doubt subject to some fluctuation according to circumstances. Dealers say they are about as follows:

GROSS TONS.

Old iron rails, gross	$14.00 to 14.50
Old steel, rerolling, gross	13.00 to 14.00
Old iron axles, gross	19.25 to 19.75
Steel melting scrap, gross	11.00 to 11.75
Car wheels, gross	11.50 to 12.50

NET TONS.

Old No. 1 R. R. wrought	$12.25 to 12.75
No. 1 machinery	10.50 to 11.00
No. 1 busheling	9.25 to 9.75
Stove plate	7.75 to 8.25
Machine shop turnings	6.50 to 7.00
Cast borings	5.50 to 6.25
Grate bars	7.25 to 8.00
Sheet iron, bundled	8.00 to 9.00
No. 1 cast scrap	10.00 to 11.00
Heavy turnings	7.75 to 8.75

PHILADELPHIA

Market Adversely Affected by Steel Corporation Suit—Dullness Rules.

Oct. 30.

Some disturbance of the iron and steel market in this territory has been caused by the instituting of the federal suit for dissolution against the United States Steel Corporation. While it is recognized that no final decree in the action can be expected for several years, the sentimental effect has been to arouse greater uncertainty among both steel makers and buyers. The announced purpose of the Steel Corporation to reduce iron ore freights in the Lake Superior regions has given buyers a further cause for asking lower prices in pig iron. All markets, pig iron, scrap and finished products are quiet. Finished steel prices continue soft.

Pig Iron.—Indifference among both buyers and sellers is still the predominant feature of the market; if anything this feeling seems to be becoming stronger on the side of producers who are discouraged over conditions and see little prospect for early betterment. Buyers are closing sparingly and then chiefly for actual needs. In the promised reduction of iron ore freights in the Lake Superior district, they have been given a fresh argument for lower prices and are bringing this to bear upon the furnaces, but with doubtful results since the effect of such a readjustment is minimized by the small use of lake ores in the east and the further fact that the season's movement of ore has been carried out on the present basis. Eastern Pennsylvania foundry

iron for early shipment continues to manifest the sharp cut in output as deliveries are being prolonged and in some cases, substitutions are being made by sellers where certain brands have been oversold. This condition is keeping prices very firm at $14.25 to $14.50, furnace, for 2X, or $15 to $15.25, tidewater. Virginia makers continue to do $12.25, furnace, for 2X for prompt shipment, and $12.50, furnace, up to Jan. 1 or shortly beyond. A northern New Jersey consumer has taken 1,500 tons of Virginia 2X for November, December and January shipment at $12.50, furnace. The leading Virginia maker has announced a new classification of irons for first quarter in which the quotations are $12.75, furnace, for 2.50 to 3 per cent silicon or 2X; $12.50 for 2 plain and $12.25 for No. 3. Some small lots of eastern puddling forge are going at $14.25 to $14.50, delivered. The cast iron pipe companies are still informally considering good-sized purchases of low-grade iron. Some of them this week offered $13.50, delivered, which was rejected by the furnaces as on northern grades they are not inclined to shade $14, delivered, and some hold their minimum at $14.25, delivered. A central Pennsylvania steel maker is still negotiating for a lot of basic for first quarter, and it is reported has been quoted under $14.50, delivered. Another central Pennsylvania consumer has been figuring on a small lot of prompt basic.

We quote for prompt and last quarter shipment as follows:

No 1X foundry	$15.25 to 15.50
No. 2X foundry	15.00 to 15.25
No. 2 plain	14.50 to 14.75
Standard gray forge	14.25 to 14.50
Basic	14.50
No. 2X Virginia	15.05 to 15.30
No. 2 southern	14.00 to 14.50
Standard low phosphorus	20.00 to 20.50

Finished Material.—Discussion in the market this week has centered upon the governmental dissolution suit against the United States Steel Corporation and trading has suffered. There is considerable speculation current as to the probable outcome of the suit and its effect upon the relative status of the Steel Corporation and independents and upon future competition. Though it is appreciated that no adjudication of the case will come for several years, conditions show sentimental disturbance because of the attack. There is a feeling of regret and some disappointment among rival manufacturers that the government has felt constrained to bring the action, but now that suit has been instituted, the hope for an early decision is expressed.

Finished conditions with eastern mills are not improving. The volume of business continues fairly even, but as a whole October tonnage has fallen below September. Steel works operations continue from 50 to 60 per cent of capacity. The rail mill of the Maryland Steel Co., at Sparrows Point, was shut down the past week through a lack of specifications, though the plant has considerable rail business on its books. Two of the four blast furnaces are blowing. The ship yard of the works is filled with work for many months ahead. But one furnace is in blast at the Steelton plant of the Pennsylvania Steel Co, one stack having just gone out because of an accident. The Central Iron & Steel Co. continues to keep both its furnaces idle and is buying iron in the open market.

The rule of sharp competition and of prices that suggest the near approach of cost levels, remains. Structural shapes are weak, the open price being about 1.30c, delivered, or 1.15c, Pittsburgh. Plates are holding more uniformly than shapes, but 1.30c, delivered, is sometimes done, and some tonnage is being regularly entered at 1.35c to 1.40c in small lots. The steel bar market ranges from 1.25c to 1.30c, delivered, or 1.10c to 1.15c, Pittsburgh. A quotation frequently made is 1.27½c, delivered, or 1.12½c, Pittsburgh. Common bar iron in the east is moving sluggishly around 1.15c, mill, or 1.22c, Philadelphia. Sheet and billet prices in this market are unchanged.

It is assured that the Central Iron & Steel Co. will furnish the 14,000 tons of plates required for the four vessels for the American-Hawaiian Steamship Co., awarded to the Maryland Steel Co., although the material will not be required for some time. The boats are to be delivered within 20 months. It is reported that the steamboat company has exercised its option calling for a fifth boat of equal size. The McClintic-Marshall Construction Co. has taken 1,700 tons for extensions to the plant of the New York Ship Building Co., Camden, N. J.; the American Bridge Co. has 800 tons for the Citizens Bank, Tampa, Fla., and it is understood will get 500 tons for the Powhattan hotel, Washington. Revised plans have been distributed for the building for the department of printing and engraving, Washington, about 4,500 tons, bids to close Nov. 14. The Baldwin Locomotive Works is taking revised bids this week on 4,000 tons for extensions of its Eddystone, Pa., plant. Prices are being taken on a single section. J. Henry Miller, Inc., Baltimore, has been given the general contract on the Royster building, Norfolk, but revised bids are to be asked for the 1,000 tons of steel. The Lapham apartment, this city, about 800 tons, is also undergoing some revision in steel prices. Bids are being taken on an office building, Washington, for private parties who will rent the structure to the government. About 600 tons are required. Plans will soon be out for a 26-story office building at Atlanta, Ga., to require about 3,000 tons. About 500 tons of finished steel, largely shapes, is called for in a Panama canal bidding for Nov. 15. The formal contract for the municipal convention hall, awarded the Chas. McCaul Co., has not yet been signed, but soon will be. The steel, about 12,000 tons, is still pending. We quote, delivered in Philadelphia and vicinity, as follows:

Structural shapes, 1.25c to 1.35c; steel plates, 1.30c to 1.40c; steel bars, 1.25c to 1.30c; common bar iron, 1.22c to 1.27c; cut nails, $1.75 to $1.80; blue annealed sheets, No. 10 gage, 1.55c to 1.60c; 4 x 4-inch open-hearth rolling billets, $21.40 to $22.40; forging billets, $26.40 to $27.40. Extras shown under Pittsburg report.

Old Material.—Dullness still holds the scrap market in eastern Pennsylvania and vicinity. Buying is restricted to small lots and bargain offerings continue to appear, bringing lower levels in quotations. Carload lots of yard steel have sold as low as $11.50, delivered, but the mills report they are having trouble to get first class railroad steel under $12.25, delivered. Car wheels are also lower. Wrought scrap is especially dull. Heavy cast scrap continues to move very sluggishly. We quote gross tons, delivered in eastern Pennsylvania and New Jersey territory, as follows:

Old iron rails	$15.50 to 16.60
Old steel rails (rerolling)	12.75 to 13.50
No. 1 heavy melting steel	11.50 to 12.25
Old car wheels	11.25 to 11.75
Old iron car axles	22.00 to 22.50
Old steel car axles	17.50 to 18.00
No. 1 R. R. wrought	13.75 to 14.25
Wrought pipe	11.25 to 11.75
Cast borings	7.50 to 8.00
Wrought turnings	8.25 to 8.75
Heavy cast scrap	12.50 to 12.75
Railroad malleable	11.25 to 11.75
Stove plate	9.25 to 9.75

Freight rates per ton on scrap from Philadelphia to principal eastern consuming points are: $0.60 to Ivy Rock, Pa.; $0.65 to Phoenixville, Pa.; $0.80 to Coatesville, Pa.; $0.85 to Bethlehem, Pa., Reading, Pa., and Roebling, N. J.; $1.10 to Pottsville, Pa., Lebanon, Pa., and Columbia, Pa.; $1.20 to Harrisburg and Steelton, Pa.; $1.40 to Milton, Pa.

Ten of the 20 hot mills of the American Sheet & Tin Plate Co., at South Sharon, Pa., were closed down for an indefinite period, Oct. 30. Some of the New Castle, Pa., mills of this company will be closed the latter part of the week.

ST. LOUIS

More Activity in Pig Iron Sales as Well as Inquiries.

Oct. 30.

Pig Iron.—A local foundry is in the market today for 2,000 tons of southern No. 2 foundry iron for one of its eastern plants, and another concern is inquiring for 1,000 tons of car wheel iron for early delivery. These, with several scattering inquiries for small tonnages, are taken to indicate a better tone for the market, although some local dealers seem to think that the suit against the United States Steel Corporation will have the effect of holding buying down to the minimum for the present, at least. Sales were made Friday and Saturday of 600 tons of southern No. 2 for first half delivery; 700 tons of southern No. 2 foundry for first quarter delivery, and 200 tons of malleable. The malleable was sold to the same concern that is inquiring for the 2,000 tons of foundry. Southern No. 2 can be had freely at $10.25 to $10.50, Birmingham basis, while northern is quoted at $13 to $13.50, Ironton. Quotations, delivered, for southern iron, to which the Birmingham freight of $3.75 has been added, follow:

Southern No. 1	$14.25 to 14.75
Southern No. 2	13.75 to 14.25
Southern No. 3	13.50 to 14.00
Southern No. 4	13.25 to 13.75

Coke.—There is no inquiry in the market for anything like a sizable tonnage of coke. Buying continues from hand to mouth. Prices are unchanged as follows:

We quote 72-hour Connellsville foundry grades, $1.90 to $2.40 for whole of 1911; 72-hour foundry, $1.90 to $2.15 on tracks and for immediate delivery; 48-hour Connellsville furnace, $1.40 to $1.50; best 72-hour Virginia foundry, $2 to $2.25; 48-hour Virginia furnace, $1.60 to $1.85. The freight to East St. Louis and St. Louis is $2.80, and $2.70 from the Virginia fields when shipment is destined beyond St. Louis.

Finished Material.—The Westlake Construction Co. let the contract Friday for 2,400 tons of structural steel for the proposed Rice hotel, at Houston, Tex., the most important deal that has taken place in structural material in the St. Louis territory for several weeks. Three steel frame office buildings are in contemplation in St. Louis, but none has taken definite form as yet. The bar iron market is said in some quarters to be almost in a state of demoralization, but this opinion does not prevail among some of the larger interests. The railroads are buying small quantities of steel for bridge work.

Old Material.—The market has again declined on some items, and is extremely dull. Nearly all of the mills in the St. Louis territory have sufficient scrap for their requirements for some time to come. Our quotations follow:

GROSS TONS.

Old car wheels	$12.50 to 13.00
Old iron rails	13.00 to 13.50
Re-rolling rails (5 feet and over)	11.75 to 12.25
Old steel rails (3 feet and under)	10.25 to 10.75
Light section relayers (45 lb. and under, subject to inspec..	19.00 to 21.00
Re-laying rails, subject to inspes.	23.00 to 23.50
Frogs, switches and guards	10.00 to 10.50
Heavy melting steel	10.00 to 10.50
Shoveling steel	9.50 to 10.00

NET TONS.

No. 1 railroad wrought	$10.00 to 10.25
No. 2 railroad wrought	9.00 to 9.25
Arch bars and transoms	13.00 to 13.50
Knuckles, couplers and springs.	9.00 to 9.50
Shafting	13.00 to 13.50
Iron car axles	17.00 to 17.50
Steel car axles	15.00 to 16.00
Locomotive tires	14.00 to 14.50
No. 1 country wrought	8.50 to 8.75
Pipe and flues	7.00 to 7.25
Tank iron and cut boilers	6.75 to 7.00
No. 1 cut busheling	8.00 to 8.50
No. 2 cut busheling	5.75 to 6.00
Cast and mixed borings	5.00 to 5.25
Machine shop turnings	6.00 to 6.50
Railroad malleable	9.00 to 9.50
Agricultural, malleable	8.00 to 8.50
Stove plates	8.50 to 9.00
Angle splice bars (iron)	10.00 to 10.50
Angle splice bars (steel)	9.00 to 9.50

NEW YORK

Corporation Suit Unsettles Market—Slow to Place Contracts.

Office of THE IRON TRADE REVIEW,
1115 West Street Bldg., Oct. 31.

Iron Ore.—Some small selling of eastern domestic ore continues, the closing of transactions involving about 15,000 tons of such material being noted, on which prices have ranged at from 7¼ to 7¾ per unit, delivered. Eastern Pennsylvania makers declare that to meet present competition in pig iron they must have 7-cent ore at the furnaces. Little dependable ore, either foreign or domestic, however, has yet been offered at such a price. Some local hematites of lean character are available at 7 cents to the furnaces, but for base mixtures no first grade ores are obtainable at such a level. The best domestic ores range from 7¼ to 8 cents per unit and foreign grades from 8 to 9 cents per unit at the furnaces. The promised reduction of ore freights on Lake Superior ore is not proving of much direct interest to eastern furnaces, since such a reduction will still not make Lake ores a competitive factor in the east.

Pig Iron.—Developments of the previous week, including the government attack upon the United States Steel Corporation and the formal decision to readjust freight rates on iron ore in the Lake Superior regions have exercised an apparent check upon the pig iron market in this territory. The particular interest of buyers is centered upon the ore rate reduction and as a result of this, they are expressing an expectation of lower pig iron prices. The largest inquiries outstanding which had included 5,000 tons for a Massachusetts textile machinery builder, 2,000 tons for a New England fire apparatus manufacturer and a considerable tonnage of non-competitive business, have been held up, although it is not believed that this delay will be long extended. Buyers at present seem to be gaging their judgment as to whether pig iron prices will be affected by the lower Superior ore costs. Eastern producers insist there is little chance for further adjustment in prices at their present low stage and also because of the minimum use of lake ore in eastern Pennsylvania and nearby districts. One point of uncertainty is the position of the Buffalo makers where under present conditions very low prices are being quoted. These furnaces working on lake ores will have the direct benefit of any lower ore cost. In the present speculation, however, the fact has apparently been lost sight of by some buyers that the change in rates will not affect this season's movement of ore. Prior to the setback given the market by the filing of the Steel Corporation suit, a fair amount of foundry iron sales on expiring contracts was being done. Sales of this character, which were largely non-competitive, reached 10,000 to 15,000 tons, including one lot of 5,000 tons in the previous week. The International Steam Pump Co. is inquiring for 1,500 tons of foundry grades, of which 1,000 is for eastern and 500 tons for Ohio plants. Buffalo makers are quoting $13, furnace, for No. 2X, eastern Pennsylvania makers from $14.25 to $14.50, furnace, and Virginia makers from $12.25 to $12.50, furnace, making tidewater quotations from $14.75 to $15.25. Virginia makers who have been doing $12.25, furnace, for October shipment, have extended this price to cover November. We quote for prompt and last quarter shipment as follows:

Northern foundry No. 1	$15.25 to 15.50
No. 2X foundry	14.75 to 15.25
No. 2 plain	14.50 to 14.75
No. 2 Virginia	15.05 to 15.30
No. 2 southern foundry	14.25 to 14.50
Malleable	15.00 to 15.25
Gray forge	14.25 to 14.50

Ferro-Alloys. — The market has quieted down a good deal and there is probably not more than 1,000 tons of

live inquiry pending. Several middle western consumers who are inquiring for fair lots, have practically withdrawn this business. The leading English makers continue to ask $38.50 Baltimore for forward shipment, but no sales are reported. Some new inquiry for 50 per cent ferro-silicon is out and small sales are reported at $60, Pittsburgh. We quote 80 per cent ferro-manganese for prompt and forward shipment at $36.50 to $37.50, Baltimore, and 50 per cent ferro-silicon at from $58.00 to $60.00, Pittsburgh.

Cast Iron Pipe.—The F. V. Smith Contracting Co. submitted the lowest bid on a contractor's letting, about 7,000 tons of 48-inch pipe and specials for another section of the Catskill aqueduct. Bids were opened by the city authorities today. The 9,240 tons of 48-inch pipe and specials for another section of the aqueduct in Brooklyn is still unplaced by the contractor, though the trade expects this to go to a Camden, N. J., shop. Prices of about $20, delivered, have been made on this business by the foundries. The general market exhibits a fair volume of business and some eastern pipe makers are expressing a belief that a turn for the better in their product has set in. We quote 6-inch pipe in carload lots at from $21 to $22, delivered f. o. b. New York.

Finished Material.—The most striking aspect of finished conditions in the metropolitan and surrounding district is the backwardness with which contracts are being placed, especially in structural material. The filing of the government's suit against the Steel Corporation has operated to further discourage and unsettle sentiment, but this condition is thought to be only temporary, as there are no immediate effects on prices or on the present status of steel makers involved in the government's action. While the suit was not unexpected, the steel trade was first inclined to be much disappointed at the government's attack. Now that the charges have been formally made, the trade hopes for a prompt hearing and decree. It is generally believed that the Steel Corporation will be able successfully to defend itself against the charge of monopoly and restraint of competition.

Finished prices continue quite irregular, but are not touching any lower levels. Quotations generally run from 1.10 to 1.15c, Pittsburgh, on steel bars and 1.15 to 1.20c Pittsburgh on plates and shapes. There is an increasing complaint among makers at the small margin of profit of present prices.

A large tonnage continues outstanding in structural contracts in this market, but final awards are backward. The American Bridge Co. has taken 700 tons for a bridge for the Buffalo, Rochester & Pittsburgh at Rochester; the Boston Bridge Works, 400 tons for the Metropolitan Storage Warehouse, Cambridge, Mass.; the Hinkle Iron Works, 400 tons for a loft on West Nineteenth street; the Philadelphia Steel & Wire Co., 250 tons for the Orpheum theater, Philadelphia, and the Virginia Bridge & Iron Works, 200 tons for the Seaboard Air Line. Bids have gone in on a bridge for the Pennsylvania Railroad over the Susquehanna river near Williamsport, Pa., the steel requirements of which are now estimated at about 2,000 tons. Bids are due this week on 1,200 tons for the Cooper Union school on Third avenue between Sixth and Seventh streets, and have gone in for 700 tons for the Brearley school at Park avenue and Sixty-first street; on 800 tons for the Queens Plaza court building, Long Island City, and 800 tons for an apartment uptown for the Carnegie Construction Co. Plans will soon be out for the Emment loft building at Twenty-ninth street and Madison avenue, this city, which will require 1,500 tons or more. Bids will be taken Nov. 8, for about 200 tons of street elevation work at Elizabethport, N. J., for the Central of New Jersey Railroad and on Nov. 18, for the Jersey City post office. The plans for the building for the bureau of engraving and printing, Washington, bids for which are due Nov. 14, specify Bethlehem sections. About 4,000 tons are needed. The board of estimate has approved the contract for section 15, of the Lexington avenue subway extensions, which was awarded to the Hegerty-Drummond Co., Philadelphia. The approval of the bond and fixing of the final details remain before the awarding of the steel for this work, about 10,000 tons, including 8,000 tons of structural work and 2,000 tons of bars. The Kansas, Mexico & Orient Railroad has placed 2,000 tons of rails with the Steel Corporation mills. We quote, delivered at New York tidewater, as follows:

Plain structural shapes, 1.31c to 1.41c; tank plates, 1.31c to 1.41c; steel bars, 1.26c to 1.31c; common iron bars, 1.25c; plates and shapes from store, 1.70c to 1.80c. Extras shown under Pittsburgh report.

Old Material.—There is no semblance of improvement either in prices or volume of trading in the scrap market. The decline in values still continues and the market has reached a stage where it is more difficult for dealers to do business with owners of scrap while it is equally difficult to interest consumers in purchases. Buying is of an odd lot character and no tonnages are moving. Prices are weak, the best offers of the mills being $11.50 to $12, delivered, on heavy steel, $8 on borings, $8.75 on grate bars and $11.75 on car wheels. We quote, gross tons, prices New York dealers will pay at tidewater, with the exception of cast scrap, which has a local demand, as follows:

Old car wheels	$ 9.75 to 10.00
Old iron axles	18.00 to 18.50
Old steel shafting	13.50 to 14.00
No. 1 heavy melting steel	9.50 to 10.00
No. 1 R. R. wrought	11.50 to 12.00
Iron track scrap	11.00 to 11.50
Wrought pipe	9.00 to 9.25
Cast borings	5.75 to 6.25
Heavy melting cast	11.25 to 11.75
Railroad malleable	9.00 to 9.50
Stove plate	8.00 to 8.25
Grate bars	6.25 to 6.50

Freight rates on scrap per ton to Steelton, Pa., Columbia, Pa., Pottsville, Pa., and Harrisburg, Pa., are $1.50 from Jersey City and $2.00 from New York; to Coatesville, Pa., Ivy Rock, Pa., Phoenixville, Pa., and Reading, Pa., $1.50 from Jersey City and $1.80 from New York; to Bethlehem, Pa., $1.10 from Jersey City and $1.60 from New York; to Roebling, N. J., $1.00 from Jersey City and $1.50 from New York; to Milton, Pa., $1.60 from Jersey City, and $2.00 from New York.

BIRMINGHAM

Pig Iron Buying Shut Off by Corporation Suit.

Birmingham, Ala., Oct. 30.

Pig Iron.—The recent developments in connection with the suit filed against the United States Steel Corporation have had the effect of shutting off any buying of pig iron, and it will probably be some days before the buying interests of the country will make up their minds that pig iron prices are low. Shipments are moving along at a rapid rate on old contracts, and in many instances customers are urging that their deliveries be kept right up to date. As a matter of fact, the sellers report very few requests to suspend shipments. This all indicates that the consumption of iron is going forward at a very satisfactory rate, regardless of the agitation about the dissolution of various large corporations. The $10 schedule remains in effect through the first part of next year, and quotations remain, for any delivery running through to July 1, 1912, approximately as follows per gross ton, f. o. b. cars furnace, Birmingham district:

No. 1 foundry	$10.50
No. 1 soft	10.50 to 10.75
No. 2 foundry	10.00
No. 2 soft	10.00 to 10.25
No. 3 foundry	9.50 to 9.75
No. 4 foundry	9.25 to 9.50
Gray forge and mottled	9.00 to 9.25

Cast Iron Pipe.—The general demand for cast iron pipe continues about as usual for this season of the year, and producers report prices fairly satisfactory. There continues to be no accumulation on the yards of the foundries, and the water pipe makers have no requests for shipments to be held up. The trade is considering an inquiry from the United States government for approximately 5,000 tons of water mains for use in the Panama canal zone. There are several small interests in the south that are inquiring for tonnages of different quantities, and especial attention is being given to these inquiries from the south; at the same time, there is a fair inquiry from several sections of the country, and it is believed that the demand will continue firm at present prices, certainly for the remainder of the year. There is enough single carload business coming along to cause the makers to feel that there is no necessity for shading prices. Quotations on such business remain on about the following basis per net ton, f. o. b. cars foundries, Birmingham district: Four to 6-inch, $22.50 to $23; 8 to 12-inch, $21.50 to $22; over 12 inch, average $21. This schedule covers water mains only, and gas pipe takes its usual differential of $1 per ton higher.

Coal and Coke.—Some improvement is noted in the coal market; but still the production of Alabama coal exceeds the actual demand, and the result is that several mines are still far short of producing at the rate on which they were operating a year ago. Coke is active in some sections of the country, while the demand is small in others. There is some movement of Alabama coke to the Pacific coast at this time for use in foundries there. The prices for 72-hour hand-picked coke are $3 to $3.50, f. o. b. ovens this district. Virginia coke is available at $2 to $2.25, f. o. b. ovens.

Old Material.—There is absolutely nothing new to record in the scrap iron market. No transactions of any consequence have taken place in some time; and about all that can be said of this market is that there is no change in prices. The schedule remains as follows, f. o. b. dealers' yards, Birmingham, per ton of 2,240 pounds:

Old iron axles (light	$12.50 to 12.75
Old steel axles	11.00 to 11.50
Old iron rails	11.50 to 12.00
No. 1 railroad wrought	10.50 to 10.75
No. 2 railroad wrought	8.75 to 9.00
No. 1 country wrought	6.75 to 7.00
No. 2 country wrought	6.00 to 6.25
No. 1 machinery, cast	8.50 to 8.75
No. 1 steel, scrap	8.25 to 8.50
Tram car wheels	7.50 to 8.00
Standard car wheels	9.25 to 9.75
Light cast and stove plates	6.00 to 6.25

The Southern Iron & Steel Co. reports that it expects to blow in the blast furnace at Alabama City the first week in November to produce basic iron for its own consumption at Alabama City. This will add about 200 tons per day to the Alabama pig iron production.

BRITISH IRON MARKET

Extraordinary Activity Noted in Both Steel and Iron Mills.

Office of THE IRON TRADE REVIEW, Prince's Chambers, Corporation St., Birmingham, Eng., Oct. 21.

Pig Iron.—The market still fails to reflect, anything like adequately, the activity in all departments of the finished iron and steel trade, as well as the large demand from foundries, ship builders, and engineering firms. The only sign of improvement in Middlesborough consists in the diminution of stocks, which have been brought down during October by about 11,000 tons. In that district, there is an entire absence of speculative buying, purchases being solely for urgent needs. Yesterday's selling price was 46s 3½d ($11.33) for No. 3 warrants, makers' iron being 46s 6d ($11.38). The amount in store is 581,600 tons, a slight decrease on the week. In other districts, firmness is maintained, and in no direction do makers find it necessary to seek for business. It is clear that the controlling influence is Middlesborough, a market which shows extreme sensitiveness to international influences, all of which are unfavorable. The eastern difficulty, allied to the Tripoli disturbances, and the very depressing reports from America all tend to keep down prices. The trade is solely dependant upon the very large home consumption, for all kinds of requirements. Shipments, during the last day or two, show a little improvement, but they ought to be much better for the time of year. The northwest coast market remains in a peculiar condition. The production there is about 20,000 tons, of which 10,000 tons is used for local steel production and the rest is sold in the open market. There is very small foreign delivery, and this week 1,000 tons of metal have been received from Rotterdam, while Barrow sent 300 tons to the same port. Stocks remain at about 53,000 tons.

Finished Iron and Steel.—The finished steel trade is enjoying an extraordinary run of prosperity. International troubles, so far from depressing business, have merely intensified the pressure upon armament works. The rolling-stock works are now equally busy. Makers of special steels in Sheffield report themselves very well off for work, but find a rather poor American demand. There is a marked addition in demand for steel for structural purposes, while ship builders keep up a huge record. In the cutlery trade, there are great complaints of a shortage of workmen. Continental steel is now practically off the market, and sellers of bars and billets have nothing to offer until February. With prices on the Continent tending upward, British users see no prospect of getting foreign iron for some time to come. British steel works are therefore the sole source of supply for semi-finished steel, and are doing very well; but they have not advanced prices. In the iron trade, makers are having a run of prosperity unknown for many years. The Staffordshire mills are full of work, and prices of finished iron are rising. In the tin plate trade there is a slightly better tone, but business is distinctly on the quiet side. The Welsh mills have sufficient reserves on their order books to keep them well engaged.

METAL MARKETS

New York

Oct. 31.

Tin.—The unexpectedly large total of pig tin shipments to domestic consumers created a favorable sentiment concerning the manufacturing branch of the trade. The aggregate of the metal sent to users in October is 3,500 tons and exceeds the amount predicted by the majority of trade prophets by from 200 to 500 tons. Consumers bought quite freely up to the closing week of the month, but since that time demand has been light. The metal sold at 42.10c and at 41.25c during the week under review, and closed today at 41.60c for nearby delivery. Arrivals since Oct. 1 aggregate 3,194 tons, but 600 tons of that total are not available for delivery on October contracts, which will reduce stocks in warehouses here to 1,169 as of Oct. 31. The London market closed steady at £190 for spot and £189 5s for three months.

Copper.—Consumers are thought to be supplied with sufficient metal to keep them out of the market, so far as large buying is concerned, for some time, and trade is rather flat. The leading sellers are holding lake at 12.50c, and electrolytic at 12.37½c, cash New York, and 12.50c, delivered 30 days. Other interests have done

business in small lots 5 and 10 points under those levels, and there is no doubt such sales could be duplicated today. Exports of copper have expanded appreciably since the middle of the month. On Oct. 15, the total exports were only 6,062 tons, and since the aggregate has risen to 21,330 tons. The trade expects that the report of the Copper Producers' Association for October will show even a more favorable condition of foreign business.

Lead.—Demand continues light, but no change in price is noticeable. Independent sellers are quoting from 4.25c to 4.30c, and the leading interest is asking 4.25c for shipments.

Spelter.—The market is up 10 points since Oct. 24. There is a fair demand, and scarcity of supply to support the present high price, which is considered far out of line with related markets. Prime western is at 6.40c in New York for prompt shipments.

Antimony.—No interest is displayed in antimony and prices are unchanged. Cookson's is 8c, Hallett's is 7.60c, and Hungarian is 6.95c.

St. Louis

Oct. 30.

Lead and Zinc.—Choice lots of zinc blende sold for a price in excess of $51 a ton in the Missouri-Kansas-Oklahoma district last week, with 60 per cent qualities grading down to $46 99, based on the previous week's spelter quotations of 6.17½c, East St. Louis, also the highest price of the year. The high price was obtained on contract offerings, and few such sales were made. The bulk of the ore sold in the open market from $45 down to $40 a ton, with choice lots bringing $48. Spelter at East St. Louis today sold for 6.15c to 6.25c. Lead was slightly stronger in the Missouri-Kansas-Oklahoma district last week, bringing $56 to $57 a ton. Lead was quiet at East St. Louis today at 4.15c to 4.17½c. Calamine brought $24 to $25 a ton on an assay base of 40 per cent qualities, while choice lots sold as high as $32 a ton.

Chicago

Oct. 30.

New Metals.—Price movements last week were comparatively narrow and irregular. Lake copper is now quoted 12½c, Chicago, and the demand is quiet. Lead declined $1 a ton during the week, being now quoted 4.20c, Chicago, although occasional sales have been made at 4.22½c. Spelter continues very firm and unchanged in price. Tin is now 42c, Chicago, having declined slightly during the week.

We quote, dealers' selling prices, f. o. b. Chicago, as follows:

Lake copper, carload lots, 12¼c; casting, 12¼c; smaller lots, ¼c to ⅜c higher. Spelter, car lots, 6.20c; lead, desilverized, 4.20c in 50-ton lots; corroding, 25c per 100 pounds higher; sheet zinc, $8 list, f. o. b. La Salle, in car lots of 600-pound casks; pig tin, 42c. Cookson's antimony, 9¼c; other grades, 8¼c to 8¾c.

Old Metals.—The market was very inactive during the week under review and shows no features of interest. Slightly higher prices are noted for tin foil, which is now quoted 35c, Chicago.

We quote the market for Chicago delivery as follows:

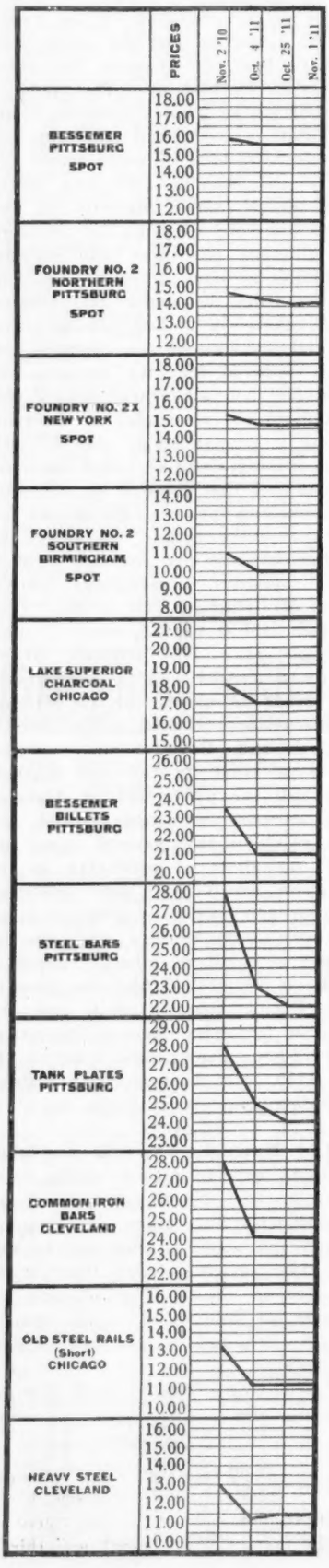
Copper wire, crucible shapes, 11c; copper bottoms, 9¾c; heavy cut crucible copper, 11½c; heavy red brass, 10c; heavy yellow brass, 8½c; No. 1 red brass borings, 9½c; No. 1 yellow brass borings, 7½c; brass clippings, 8c; lead pipe, 4c; zinc scrap, 4.60c; scrap aluminum, 12c; tea lead, 3¾c; No. 1 pewter, 28c; block tin pipe, 37c; tin foil, 35c; linotype dross, 3¼c; electrotype dross, 3c; stereotype plates, 4½c; stereotype dross, 3¼c; prime slab zinc dross, $88 to $90 a ton.

Has Abolished New York Office

Hickman, Williams & Co. announce that their New York office, at present located at 30 Church street, will be discontinued on Nov. 1, and that the territory heretofore covered from that office will be handled from its Philadelphia office as headquarters. This change, it is announced, is owing to the fact that the company has lately centralized its bookkeeping and accounting departments in its Cincinnati office and that J. O. Henshaw, one of the partners, is now making his headquarters in Philadelphia instead of New York. The selling force in the New York territory will remain the same as in the past. The Boston office will continue to attend to the business in that territory.

Blast Furnace A of the Sparrows Point works of the Maryland Steel Co. recently broke all production records for the state when it made 461 tons in 24 hours. The stack was recently rebuilt along most modern lines and relighted. The previous high record was 452 tons, made by D stack, Oct. 23, 1909.

PRICE CHART



CUBAN ORES

Being Experimented With By Eastern Pennsylvania Merchant Furnaces.

Some experimenting with north coast Cuban ores is being carried on by eastern Pennsylvania furnaces to determine the qualities of this material for meeting the requirements of the merchant pig iron trade in the east, particularly in steel-making metal. Recently a trial cargo of Mayari district ore was sold in its natural state to the Warwick Iron & Steel Co., Pottstown, Pa., and this pig iron maker is preparing to make a trial cast, using this ore in its mixture. The ore in question is of a Bessemer quality and contains some chrome and nickel. In its natural state, its moisture content is high. The Spanish American Iron Co., a subsidiary of the Pennsylvania Steel Co., is a large holder of north coast Cuban ores, but other steel companies, some of them in eastern territory, have important holdings in that district. The result of the present experiments of making iron for the market with this ore will be of immediate importance to these latter interests, some of which do not operate their own blast furnaces and are buyers of pig iron in the open market.

Receiver is Asked

A receiver for the Universal Adding Machine Co., of St. Louis, has been asked for by J. H. Taylor and Ethel M. Bennett, of Chicago, both stockholders of the company, in a petition to the circuit court. The petition asks that the sale of the stock of the Universal company to the Burroughs Adding Machine Co. be set aside, that the election of a board of directors of the Universal company be authorized under the direction of the court and that the Burroughs company be enjoined from disposing of the stock of or from taking over $300,000 of bonds of the Universal company.

Crucible Election.—At the organization meeting of the board of directors of the Crucible Steel Co., which was held Oct. 27, the following executive committee and officers were re-elected for the ensuing year: Executive committee, Herbert DuPuy, C. C. Ramsey, James H. Park, George E. Shaw, H. S. A. Stewart, John A. Sutton and H. D. W. English. Officers: Chairman of executive committee, Herbert DuPuy; president, C. C. Ramsey; first vice president, John A. Sutton; second vice president, J. W. Dougherty; third vice president, O. H. Wharton; fourth vice president, G. W. Sargent; secretary, Charles W. Rowlands, and treasurer, George A. Turville.

Suit Filed to Recover Ship Rebate

The Commonwealth Steamship Co. has brought suit in the United States circuit court against the American Ship Building Co. to recover $60,000, which it claims is the amount of excess payment upon the construction of the steamer Henry A. Hawgood in 1906. This steamer was contracted for by Henry A. Hawgood, now deceased, on behalf of the Minerva Steamship Co., now merged into the Commonwealth. The contract price for this steamer was $420,000, of which, the petition alleges, Henry A. Hawgood received $35,000 in commission and that altogether the contract price was $60,000 in excess of the market at the time the contract was let. This steamer has since been sold to Capt. W. C. Richardson, of Cleveland.

Machinery Required

The Milwaukee Concrete Mixer & Machinery Co., whose recent increase in capital stock from $25,000 to $60,000 was recently noted, advises that this was done because of the recent increase in business. The company is in the market for machines for manufacturing concrete mixers, such as lathes, boring mills, drill presses, saws, punches and milling machines. The officers of the company are: President and general manager, W. J. Rosebery; secretary and treasurer, A. G. Bodden.

Demand "Labor Trust" Be Prosecuted

Directors of the National Association of Manufacturers, New York, recently passed a resolution demanding the prosecution by the government of the so-called "labor trust" under the Sherman anti-trust law, as a combination in restraint of trade.

Traffic Club Dinner. — The tenth semi-annual dinner of the Traffic Club of Pittsburgh, will be held Nov. 9, at the Ft. Pitt hotel. The speakers of the evening will be L. E. Johnson, president of the Norfolk & Western Railway Co., and G. W. Simmons, vice president of the Simmons Hardware Co., St. Louis. J. C. Wood, general agent of the Chicago, Milwaukee & St. Paul Railway Co., at Pittsburgh, will preside as toastmaster.

DISCUSS BUSINESS

At Coming Sessions of Academy of Political Science.

Elbert H. Gary, chairman of the United States Steel Corporation, and George W. Wickersham, attorney general of the United States, will be the guests of honor at the annual meeting dinner of the Academy of Political Science in New York City which will be given at the Hotel Astor, New York City, Nov. 10. The topic for discussion at the dinner will be "The Relation of Government to Business." The speakers of the evening will be United States Senator Albert B. Cummins, George W. Perkins and John Hays Hammond. The late Robert Mather was also included in the original choice of the speakers for the occasion.

The dinner will be the second session of the thirty-first annual meeting of the academy which is to have for its general topic, under consideration, "Business and the Future Welfare." The subject for the first section will be "The Improvement of Labor Legislation;" for the third "Social Efficiency in Business," and for the fourth "Financial Facilities for Wage Earners." All the sessions except the dinner meeting will be held at Earl Hall, Columbia University. The initial session will be held Nov. 10, at 2:30 p. m. and the final meeting Nov. 11, at the same hour. The president of the Academy of Political Science in New York City is Samuel McCune Lindsay, professor of social legislation of Columbia university. The advisory council of the association consists of United States Senator Elihu Root, J. Pierpont Morgan and Francis Lynde Stetson.

Welsh Tin Plate Trade

Swansea harbor trust returns for the week ending Oct. 14, with comparisons, follow:

	Received	Shipped	Stocks
Week Oct. 14, boxes..	114,781	192,004	79,288
Previous week, boxes..	115,341	131,461	156,508
Same week last year, boxes	103,137	62,020	201,390

Inspected Works

Officers and directors of the Lackawanna Steel Co., headed by President E. A. S. Clarke, on Friday, inspected the works of the Youngstown Sheet & Tube Co., at Youngstown, O., following their annual meeting. President J. A. Campbell, of the Youngstown company, is a director in the Lackawanna company.

RELIEF SOUGHT

By Mahoning Valley From Present Freight Rates.

"Unless we obtain relief from the railroads in the reduction or equalization with our competitors of freight rates on raw materials, the blast furnaces and steel works in the Mahoning and Shenango Valleys cannot endure," said Jas. A. Campbell, president of the Youngstown Sheet & Tube Co., to a representative of THE IRON TRADE REVIEW. Mr. Campbell is chairman of a committee of iron and steel manufacturers of the Mahoning and Shenango valleys, which is in charge of a movement for more equitable freight charges on raw materials to that district.

"The prediction made that iron and steel production in the valleys would 'shrivel up' unless relief be granted, is already a fact," continued Mr. Campbell. "Practically all the merchant furnaces in the district are now idle, with the exception of those which have special alliances with other interests that absorb their output or those that are able to pile and carry large stocks of iron. One of two things is true in our present situation: Either we have picked a wrong location for our plants, or the freight rates are excessive. We take the position that the rates are excessive as the railroads have made more money from the patronage of the iron and steel manufacturers in the Mahoning and Shenango Valleys than they have on any similar haul. We may finally have to pocket our pride and say that we made a mistake in locating our plants as they are but we shall not do that until we have had the opportunity of doing business on an equal basis with our competitors.

"We want to be fair in this matter and would be content if the railroads would raise the rates on similar hauls to our competitors so that we could be put in a more favorable position through our competitors and ourselves being placed on the same basis. But the railroads cannot raise the rates of our competitors, so that we are asking for an equitable reduction in our own rates. We made a similar complaint several years ago with the railroads, but were turned down. Business in the steel trade then became good and we were content to let matters rest. Now it is a matter of life and death with us and we must have relief. We are not asking for any fixed reduction but are putting it up to the railroads to place us on an equitable basis and grant us rates on raw materials that will compare with those under which our competitors are doing business. We have believed that the freight rates on iron ore from the Superior ranges to the upper lake ports would take care of themselves and we have left it to the government to see that the fair thing was done. This has already happened."

The committee of which Mr. Campbell is chairman consists of five of the prominent iron and steel manufacturers of the Mahoning and Shenango Valley. Besides the chairman, it includes Thomas J. Bray, president of the Republic Iron & Steel Co.; John Stambaugh, secretary and treasurer of the Youngstown Steel Co.; H. W. Heedy, secretary and treasurer of the Andrews & Hitchcock Iron Co., and W. P. Snyder, president of the Shenango Furnace Co. The movement was organized about a month ago and is now being vigorously pushed. The manufacturers are asking for a reduction or equalization of the freight rates on iron ore from lower lake ports, on coal from the mines of the Pittsburgh district and on coke from the Connellsville region to their plants. Among the railroads, which engage in such hauls, are the Pennsylvania, the Erie, Baltimore & Ohio and Pittsburgh & Lake Erie.

Proposed Higher Rates Are Suspended

The interstate commerce commission, on Oct. 28, suspended, until Feb. 29, cancellation of the commodity freight tariffs on iron and steel articles by the rail carriers operating from Pittsburgh, Buffalo and other eastern points to western destinations, particularly points in Illinois, Iowa and Missouri. The tariffs previously filed with the commission aimed to place the iron and steel articles under class rates which are much higher than the commodity rates. The commission, in the belief that the increases are not warranted, suspended their inauguration from Nov. 1 to Feb. 29, 1912, in order to afford time for further investigation. The order affects several hundred roads operating directly or indirectly in central freight association territory.

About 1,000 boilermakers at the works of the American Locomotive Co., Schenectady, N. Y., went out on a strike, Oct. 27, because they were directed to work on 30 engines recently ordered by the New York Central railroad, whose boilermakers are on a strike.

ZONE SUGGESTED

In Which Lower Ore Carrying Rates Shall Prevail.

Formal action declaring the purpose to cancel the Great Northern ore lease and to reduce the freight rates on ore of the subsidiary railroads between the mines in the Superior district and the ports at the head of the lakes, was taken at a special meeting of the directors of the United States Steel Corporation, at New York, Oct. 26. This step followed the decision to abrogate the lease previously made by the finance committee of the Steel Corporation, the news of which had become known to the general public. The action of the directors puts the final matter of annuling the lease up to the directors of the Great Western Mining Co., the Steel Corporation subsidiary which executed the instrument with the trustees of the Great Northern ore holdings.

The reduction of the freight rates on iron by the Steel Corporation's railroads, the Duluth & Iron Range and the Duluth, Missabe & Northern from points on the Vermillion and Messabi iron ranges to Duluth and Two Harbors, it is provided, shall be to amounts not exceeding 60 cents per gross ton. The suggestion is offered to the directors of these railroads in making the reductions that all points upon the ore ranges reached, shall be included in one zone or district.

Cleaning Up Ore

Interest in the lake trade now centers in grain. There is considerable of this commodity to be moved and shippers have marked up the rate to 1¼ cents from the head of the lakes to Buffalo. At that figure they have lined up about 40 cargoes and are in the market for more. Some of the vessel men, however, believe that the rate will advance and are holding off.

The ore trade is in a state of clean-up and is without interest. So many small carriers have gone into winter quarters that the coal shippers are having difficulty in getting sufficient tonnage of this class.

Re-elected Officers

At the annual meeting of the Republic Iron & Steel Co., which was held in Youngstown, O., Oct. 26, all of the following officers were re-elected: President, T. J. Bray; vice president and treasurer, H. L. Rownd; secretary and general counsel, Richard Jones Jr.

CONGRESS CALLED

Of National Business League.—Important Questions Slated.

The board of directors of the National Business League of America has issued an official call for a national business congress, for the consideration of imperative measures for the general welfare, to be held in the Congress hotel, Chicago, Dec. 11, 12 and 13.

The calling of the congress came as a result of a conference of the officials of several of the leading and industrial commercial organizations of the country, whereupon the board of directors decided to assume all responsibility of the meeting. Its real purpose will be to find a common ground on measures now hampered by several different plans and opinions, upon which basis all may agree, thus insuring unity of action in the various campaigns for national legislation. The principal subjects to be discussed by the congress are as follows: "Creation of an American Merchant Marine;" "Promotion of American Foreign Commerce;" "Pressing Needs for Currency Legislation;" "Permanent Exposition of American Products in Paris, France," and "Transportation." Each business organization invited will be entitled to three delegates, and one delegate for every additional 500 members, each of whom will be allowed a five-minute talk during the conference.

Luncheon to T. Frame Thomson

George Bartol, of the Otis Steel Co., gave a luncheon at the Union Club, Cleveland, on Monday, Oct. 30, in honor of T. Frame Thomson, of London, a director of the company. There were present, Judge W. B. Sanders, H. E. Higgins, D. T. Croxton, H. B. Hare, J. J. Bever, of Cleveland, J. G. Butler Jr., of Youngstown, and G. W. House, of Detroit. The luncheon was of an informal character and was more or less of a family affair, being confined to interests directly and indirectly associated with the Otis Steel Co. Brief talks were made by Mr. Bartol, Mr. Thomson, Mr. Butler and Judge Sanders. The discussion was purely personal in nature and had no relation to business. The ladies present were, Mrs. Bartol, Mrs. Thomson, Mrs. Sanders, Mrs. Higgins, Mrs. Croxton, Mrs. Hare, Mrs. Bever and Mrs. H. F. Deverell.

Foremen's Association.—At a meeting of the Pittsburgh Foremen's Association, held Oct. 20, Robert B. Thomson, secretary of the Buffalo Foundry Foremen's Association and president of the Associated Foundry Foremen, presented the Pittsburgh Foundry Foremen a handsomely-carvel lignum-vitae gavel. This gavel has the butt and pein of a rammer with a small flask between these sections to hold the handle. On either side of the pein are engraved silver plates. This gavel was presented by the Associated Foundry Foremen to the Pittsburgh society in appreciation of the reception given by the latter to the foundry foremen in attendance at the foundrymen's meeting on May 22.

Scrap Defined by Interstate Commission

The case of the American Mfg. Co., of Chattanooga, Tenn., which complained against rates charged by the Louisville & Nashville railroad on scrap iron, was decided by the Interstate Commerce Commission Oct. 24, in favor of the railroad. The commission decided that under the southern classification, pieces of iron that can be manufactured into various articles without remelting cannot be considered as scrap iron, and as the American Mfg. Co. has no facilities in its factory for remelting iron, it could not use iron of the character rated as scrap.

Public Sale of Hamilton Blast Furnace

The plant of the Hamilton Iron & Steel Co., at Coke Otto, near Hamilton, O., will be sold at public auction on Dec. 14, on the company's property. The sale has been requested by the majority of interest of the holders of the bonds of the company, and will be made without any judicial proceedings for such purpose. Dudley V. Stuphin, of Middletown, O., is the trustee in charge of the property.

Iron Producers Meet

A number of pig iron producers from the Hanging Rock district met in Cincinnati recently to form a plan whereby a number of abuses now in existence might be abolished. The question of credit and stocks was discussed as well as the mutual benefit that might result from co-operation.

The Wellston Steel & Iron Co., Wellston, O., expects to relight one blast furnace some time in November.

LARGEST EARNINCS

Of Any Quarter of Year Shown by Steel Corporation Statements.

With total earnings of $29,522,725, the showing of the United States Steel Corporation for the third quarter of the year ending Sept. 30 was the largest in the total of revenue of any quarter of the current year. The third quarter earnings show an increase of $1,414,205 over the preceding quarter, when the earnings were $28,108,520 and $6,003,522 over the first quarter of the year, when the earnings were $23,519,203. Compared with the third quarter of 1910, however, when the earnings were $37,365,187, there is a reduction of $7,842,462, and the showing is the smallest of any third quarter since 1906, with the exception of in 1908, when the total was $27,106,274.

In its entirety, the statement is more favorable than had been expected, owing to the disturbed condition of trade that has recently prevailed. The August earnings of $10,710,145 are the heaviest of any single month of the present year and the largest of any month since September, 1910, when $12,100,243 was earned.

The directors of the Steel Corporation at their meeting, Oct. 31, declared the regular dividends of 1¾ per cent on the preferred stock, payable Nov. 29, and 1¼ per cent on the common stock, payable Dec. 1. The complete statement of earnings for the third quarter is as follows:

July	$ 8,750,467
August	10,710,145
September	10,062,113
Total earnings	$29,522,725
Charges and allowances	6,806,568
Net earnings	$22,716,157
Interest, etc.	7,311,963
Balance	$15,404,194
Dividends	12,658,700
Surplus for quarter	$ 2,745,494

Unfilled Orders on Hand.

Sept. 30	3,611,317 tons

Large Locomotive Order

The Montreal Locomotive Works, Ltd., has booked an order for 51 locomotives for the Canadian Northern Railway Co., which includes 31 10-wheel passenger locomotives and 20 10-wheel freight locomotives. This builder has also received an order for one rotary snow plow with tender from the Canadian Northern Railway Co. The American Locomotive Co. has taken two 10-wheel locomotives from the New Orleans Great Northern Railway.

HEALTHY INCREASE

In Steel Corporation Business Since Filing of Suit.

New York, Nov. 1. (By wire.)—It is singularly interesting that since the filing of the government suit, the new business taken by the United States Steel Corporation has shown a healthy increase over the country in practically all lines except rails, which are slow. One explanation offered is that the suspense over the government's probable action, which has over-hung the market so long, is now lifted and steel makers now know exactly what they are facing. October, which began poorly in new business, ended with considerable improvement and will make a fair showing. Finished steel prices are no lower and some makers have recently tried out advances and have obtained them in some cases.

Basic and Bessemer Average

Pittsburgh, Nov. 1. (By wire.)—The monthly average price of Bessemer pig iron for October, as announced from one source, is given as $14.5375, valley, as compared with $15 in September. This is the lowest monthly average on Bessemer since August, 1905. The average on basic for October is given as $12.515, as compared with $12.667, valley.

Voted to Strike

While official returns of the vote among the shop men on the Rock Island system have not yet been announced, it is known that a majority of the crafts involved have voted for a strike. The point at issue is an increase in wages, averaging 10 per cent, which is not in dispute in the Illinois Central or Harriman strikes. The management of the Rock Island has already recognized the federated shop crafts.

Explore Ore Holdings

The Oliver Iron Mining Co., Chicago, will soon begin work to line the Hamilton shaft of the Chapin mine on the Menominee range with concrete. This shaft is 1,450 feet deep and 24 feet 4 inches by 9 feet 8 inches inside dimensions. It is understood, also, that the United States Steel Corporation has decided to explore a large tract of iron ore property six miles southeast of Gwinn, in the Swanzy district of the Marquette range.

Given Medal. — Sir William H. White, British naval constructor, will be presented the John Fritz medal for 1911 at the annual dinner of the American Society of Naval Architects and Marine Engineers at the Waldorf-Astoria, New York City, Nov. 17. The award will be made in recognition of Sir William's achievements in naval architecture. He will be the guest of honor at the dinner and at the annual meeting of the society, which will be held Nov. 16 and 17, he will present a paper.

Personal

Howard M. Hanna Jr., was admitted to membership in the firm of M. A. Hanna & Co. on Nov. 1.

C. E. Pettee has resigned his position as works manager of the Herman Pneumatic Machine Co., Zelienople, Pa.

William Robertson, who was the manager of the machine tool department of the Frontier Iron Works, Buffalo, has been appointed general sales manager of the company.

R. A. Wilson has accepted a position as gas expert for the Carnegie Steel Co., at Youngstown, O. Mr. Wilson was formerly connected with the Snow Steam Pump Works, Buffalo, in a similar capacity.

E. J. Kearney, of Kearney & Trecker, milling machinery, and E. P. Bossert of the Pfister & Vogel Leather Co., Milwaukee, have been appointed members of the advisory committee of the Wisconsin Industrial Commission, with special reference to the installation and maintenance of safety appliances in workshops.

The Southern Fittings & Foundry Co., Savannah, Ga., has recorded a mortgage of $100,000 to secure bonds for the purchase of a site and the construction of a plant.

The Ingersoll-Rand Co., of New York, has purchased the plant of the J. George Leyner Engineering Co., Denver, Colo., which manufactures a drill that the purchasing company desired to secure control of. J. G. Leyner, inventor of the drill, will continue as president of the company under the new management.

The American Ship Windlass Co., Philadelphia, announces that on Nov. 1, its shops and main office will be removed to its new home at Cumberland street and Aramingo avenue, Philadelphia. Increased shop and foundry facilities will enable the builders of the Providence windlass to meet the needs of the increased demand.

STRUCTURAL AWARDS

And Other Business Awarded.—Good Export Orders.

New York, Nov. 1. (By wire.) — The Illinois Steel Co. will furnish about 7,000 tons of plain material for the Field memorial building, Chicago. This building was originally designed for Bethlehem sections and it had been reported as having gone to that company. Bethlehem shapes will be used on the Otis Elevator building, Chicago, about 2,500 tons. There is no slowing down of the export trade. The American Bridge Co. has taken 2,500 tons for two buildings at Buenos Ayres.

The American Sheet & Tin Plate Co. has 1,200 tons of special galvanized sheets for South Africa railways, which is new business for this country, as it usually has gone to European mills. A Chilian railroad has placed 3,500 tons rails with the United Steel Products Co. Domestic rail business is very light. The Tennessee company has 3,000 tons of rails for a lumber company.

James Stewart & Co. have taken the general contract for a building in Denver, 4,000 tons. The Clyde Steamship Co. is figuring on placing a boat with eastern yards. The New York Central is reported considering the purchase of 5,000 additional freights. Car business is looking better.

Works Operating

The Standard Steel Tank & Mfg. Co., which recently purchased the plant of the McAllister-Byrne Construction Co. at Girard, O., has begun operating. The company manufactures iron work, stacks, stand-pipe, grain tanks, riveted water pipe and oil refinery work. The new owners intend to increase the capacity of the works at Girard. J. F. McLaughlin is president, and F. M. Strecker general manager of the company.

Westinghouse Veterans.—The tenth annual reunion and banquet of the Westinghouse Air Brake Veteran Employes' Association was held at Wilmerding, Pa., Oct. 26, with 275 members present. E. A. Craig, manager of the southwestern branch of the Westinghouse Air Brake Co., was toastmaster, and the address of welcome was made by Thomas Campbell, president of the association.

The coal strike that has kept 7,000 miners in Alberta and British Columbia, Can., idle for more than six months, has been settled.

Case-Hardening and Heat-Treating With Oil

Treating Transmission Gears With Oil-Fired Furnaces in the Plant of the Warner Mfg. Co, Toledo, O.

A plant for case-hardening and heat-treating transmission gears, equipped with oil furnaces, has been built by Walter McLeod & Co., Cincinnati, for the Warner Mfg. Co., Toledo, O. The equipment consists of a battery of five case-hardening furnaces, shown in Fig. 1, with heating chambers, 34 x 72 inches, and two heat-treating furnaces, Fig. 2, with heating chambers, 32 x 48 inches. The blast is furnished by a direct motor-driven steel fan pressure blower, installed by the American Blower Co., Detroit, and a rotary oil pump is geared to the blower shaft. The furnaces are equipped with multiple indicating pyrometers installed by the Taylor Instrument Co., Rochester, N. Y. The oil is stored in a 12,000-gallon tank and a meter has been installed for determining the fuel consumption. The case-hardening furnaces have a capacity, at 1,300 degrees Fahr., of 190 sets of transmissions per day with an average penetration of 1-30 of an inch, at an oil consumption of 840 gallons, which is equal to 4.4 gallons per set or a cost of 9.94 cents per set with oil at 2¼ cents per gallon. The carbonizing material used is granulated raw bone. The heat-treating furnaces are used for various classes of work at an average oil consumption of four gallons per hour.

All the furnaces are built of the best grade of fire brick and are encased in sectional cast iron ribbed plates held in position by tie rods and bolting strips. The furnaces are of the semi-muffle type, the combustion chambers occupying a position adjacent to the heating chambers, heating the material and then passing into flues in the side walls leading under the hearth into the top of the furnace. It is customary to build the combustion chamber at or below the hearth line, the objection to any other type of construction being the expense of renewing the hearth and baffle blocks every few weeks. The method adopted in the construction of these furnaces involves little expense as the hearth is practically a solid foundation built of standard shape fire brick, the top course only requiring renewal on account of the wear of the boxes.

The combustion chamber is so constructed that the heat is only retarded sufficiently to permit the gases to fill the chamber and in turn to escape at a uniform pressure through the several ports leading into the heating chamber. The covering forming these pockets is made of standard shape fire brick and can be removed easily while the furnace is hot, if necessary. One oil burner is required for each furnace. These burners are placed in front of the furnaces, parallel with the combustion chambers and an auxiliary air blast enters the opposite end of each furnace, which is intended to take the place of a baffle. The auxiliary air blast is controlled by a valve located underneath the oil burner to enable the operator to easily regulate the furnace. The oil burners are of the standard pressure blower type and are operated with an air pressure of nine ounces.

These furnaces are operated at 1,360 degrees Fahr., with a variation not exceeding 20 degrees throughout the entire hearth. The temperature measurements are made by inserting a thermo-couple in each corner of the furnace, the couples occupying the same position after being calibrated for the test. The case-hardening furnaces operate at a temperature of 1,560 degrees Fahr., and show a decrease in temperature of 250 degrees Fahr. during the discharging periods.

The oil and air supply is furnished by an electrically-driven unit which consists of a No. 8 steel fan pressure blower, direct connected to a 15-horsepower motor by a flanged coupling. This unit is illustrated in Fig. 3. This motor is mounted on a pedestal attached to the side of the blower on which is also mounted a rotary oil pump which is geared to the blower shaft. The blower has a capacity considerably in excess of the present requirements and was installed to provide blast for additional furnaces. The piping has been arranged for the maximum capacity. At the present speed of 1,480 revolutions per minute, approximately only a 20 per cent ratio opening is used to supply 2,830 cubic feet of free air per minute at nine ounces. The oil pump is equipped with check and relief valves, pressure gage, etc., for the suction return system for drawing oil from the central storage supply. A meter is located in the

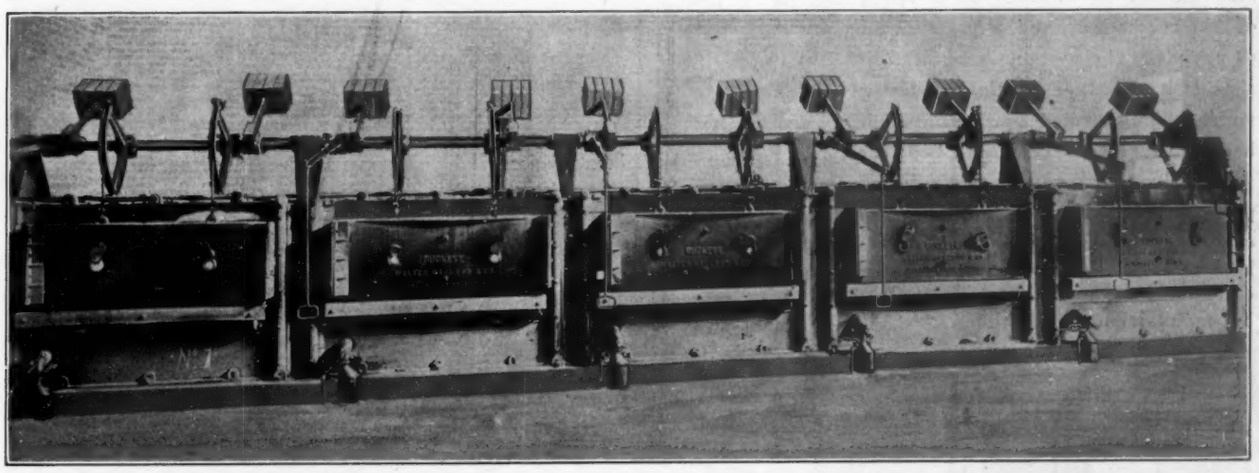


FIG. 1—A BATTERY OF FIVE CASE-HARDENING FURNACES, INSTALLED IN THE PLANT OF THE WARNER MFG. CO., TOLEDO

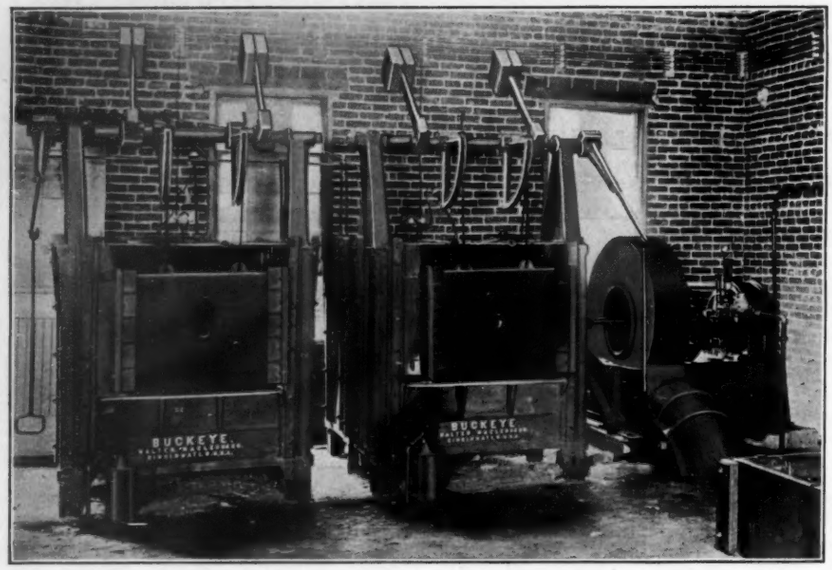


FIG. 2—TWO OIL-FIRED HEAT-TREATING FURNACES

supply line to the furnaces at the oil pump and is so arranged that it can be cut out or used continuously if desired. The pump capacity is nine gallons per minute at a speed of 180 revolutions and a pressure of 40 pounds. The pyrometer outfit consists of a wall type multiple indicator with thermo-couples for each chamber located in the center of the rear wall. The temperature is indicated periodically and the use of properly calibrated pyrometers in work of this kind is of great importance, as it is essential that a uniform temperature be maintained at all times.

Box Column Drilling Machine

The Sibley Machine Tool Co., South Bend, Ind., has recently placed on the market a new box column, all-geared drilling machine, which is provided with direct drive. The speed box is located on top of the column out of the way; all the gears are enclosed and run in oil, and all the bearings are provided with self-oiling devices.

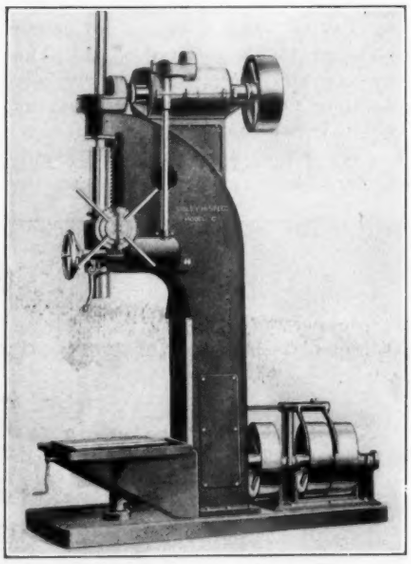
The machine can be started and stopped, the feeds and speeds changed and the table adjusted by the operator without moving from his position in front of the press.

The speed box is located on top of the column, which necessitates the use of only one pair of bevel gears to deliver the power to the cutting tool. Any one of the eight speeds can be selected instantly without running through intermediate changes. The semi-steel feed gears are always in mesh and changes are effected by means of a patented internal key which does not stick or bind. Six long split bushings, made of a special bronze, with 97 square inches of bearing surface, carry the main gear shafts. The entire mechanism runs in an oil bath insuring constant and thorough lubrication. Hoods at the end of the bearings catch the surplus oil which is returned to the case through large drains.

The feed mechanism derives its power from the main drive shaft which rotates the spindle and is geared down in such ratios that a powerful feed is obtained. There is only one pair of steel bevel gears in the feed. These, together with all feed gears and the steel worm run in an oil bath. Four changes and a neutral position are obtained by moving a small knob in the center of the hand wheel. A positive, adjustable collar on the graduated spindle sleeve trips a latch at the desired depth of hole and the entire mechanism swings down from the worm gear on a large hinge pin.

The oil pump, tank and all pipes for supplying lubricant to the cutting tool are enclosed within the column and the cutting compound returns to the tank through a drain in the table which is not visible outside. By this means the machine can be kept very neat and the compound free from chips and dirt.

There are no exposed moving parts except the pulleys and spindle. The



SIBLEY BOX COLUMN DRILLING MACHINE

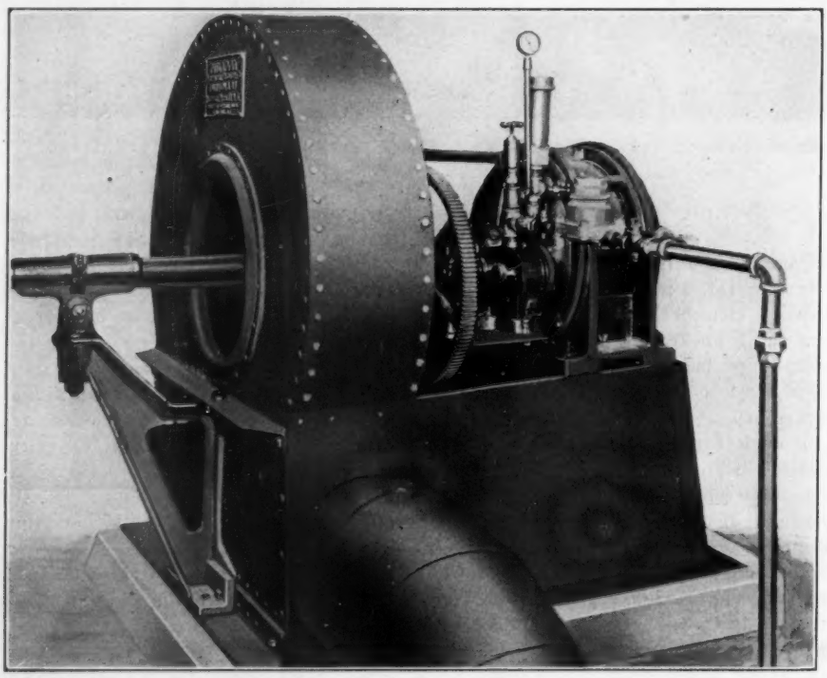


FIG. 3—THE BLOWER, OIL PUMP AND MOTOR

principal dimensions of the drill press are as follows:

Swing, 24 inches; maximum distance spindle to table, 27 inches; feed of spindle, 12 inches; smallest diameter of spindle, 1¾ inches; working surface of table, 16 x 20 inches; vertical traverse of table, 20 inches; diameter of all pulleys, 13 inches; face of all pulleys, 4½ inches; spindle speeds, 75 to 450 revolutions per minute; countershaft speed, 400 revolutions per minute; height over all, 6 feet 10 inches; weight, 2,200 pounds; floor space required, 29 x 57 inches.

The Van Norman Internal Grinder

In Fig. 1 is shown the Van Norman internal grinder, built by the Waltham Watch Tool Co., Springfield, Mass. This machine was designed to meet the requirements of the trade for an internal grinder with a high speed spindle of ample dimensions, which will carry the small emery wheels adapted for internal work at peripheral speeds equal to those on wheels used for outside grinding and at the same time to have sufficient belt and driving power

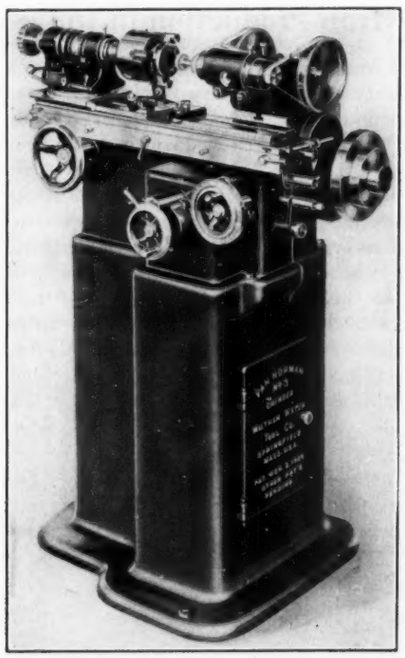


FIG. 1—THE VAN NORMAN INTERNAL GRINDER

to maintain these speeds while operating at the maximum cutting capacity of the wheels. The quill and spindle construction with a special oiling system is one of the important features of this machine and a new cam-operated mechanism is employed for the traverse of the table.

To adapt the machine for external grinding the table is made with a swivel top, which is secured to the lower member by cam binders, located at either end. On the under side of the

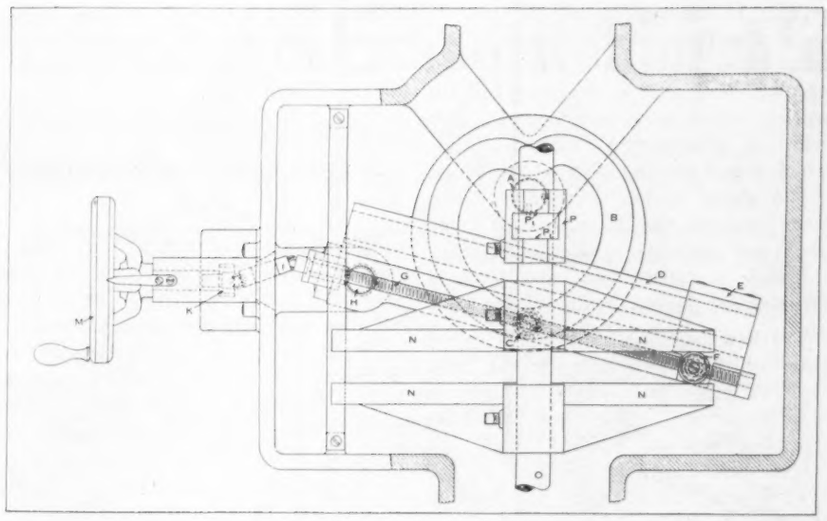


FIG. 2—THE CAM MECHANISM FOR THE RECIPROCAL MOVEMENT OF THE TABLE

table, and extending its entire length, is a dovetail slideway, in which is fitted a long slide piece attached to and moving with the automatic reciprocating parts of the cam-operated mechanism. A lever binder, located at about the center of the table, is used for clamping the table to the slide piece and when this binder is released the table can be operated by hand by the wheel at the left of the machine. An adjustable stop, carrying an adjusting screw, is fitted in the dovetail slideway at the left of the table. This stop is used to locate the table so as to place the work in proper endwise cutting relation to the emery wheel.

The cam mechanism controlling the reciprocal movement of the table is illustrated in Fig. 2; *A* is a vertical cam shaft driven by a change gear mechanism and carries the heart-shaped face cam, *B*. A swinging arm, *D*, is pivoted to a vertical shaft, *H*, and projecting from its under side is a roll, *C*, which enters the trackway of the cam. On the upper surface of the swinging arm and extending its entire length, is a dovetail slideway on which is fitted a slide, *E*, carrying a roll, *F*. A screw *G*, serves to adjust the slide, *E*, so that the roll may be moved to any point from the extreme outward position to one in which it will coincide with the pivotal center of the shaft, *H*. A double universal joint, *I*, connects the screw with a pinion, *K*, on the shaft, which is revolved by the hand wheel, *M*. A shaft, *O*, fitted in the body of the machine has two angle sections, *NN*, attached to it with parallel vertical faces which engage the roll, *F*, and it will be noted that whatever reciprocating movement is imparted to the roll, *F*, through the action of the cam and the swinging arm, *D*, will be imparted to the shaft, *O*. As the slide, *E*, with the roll, *F*, is adjusted toward the pivotal shaft, *H*, the reciprocating movement of the shaft, *O*, will be correspondingly reduced and if the roll, *F*, is drawn back so its center will coincide with the center of the shaft, *H*, no movement of the shaft, *O*, will result.

The roll on the under side of the swinging member, *D*, which engages with the cam is located about half-way between the pivotal shaft, *H*, and the extreme outer position of the roll, *F*, and any length of reciprocating movement of the shaft, *O*, can, therefore, be obtained. While the swinging arm, *D*, actuated by the cam, has a uniform reciprocating movement, the stroke of the rod, *O*, which governs that of the table of the machine, will be varied ac-

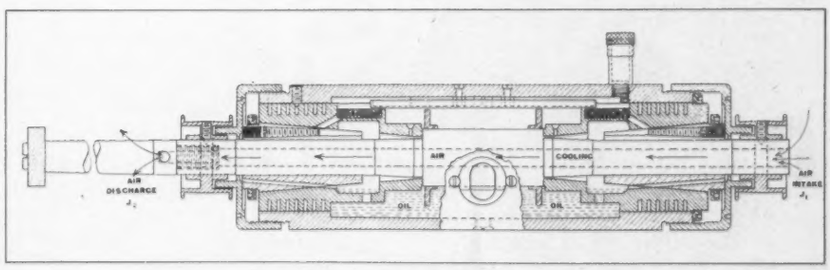


FIG. 3—SECTIONAL VIEW OF SPINDLE AND QUILL

cording to the position of the roll, *F*, on the swinging arm. A block, *P*, is attached to the rod, *O*, with a cross opening, *P-1*, and in the table of the machine there is a long dovetail slide with a downwardly projecting lug, which enters the slot, *P-1*, of the block, *P*. A clamp, or binder, with a binding lever secures the table to the slide piece and when the binder is released, the slide is carried back and forth in the slideway by the action of the cam.

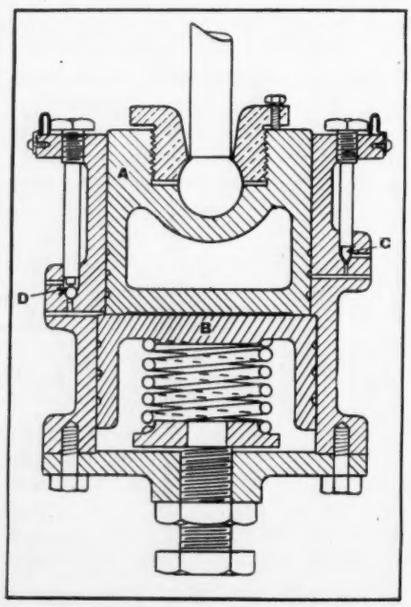
The headstock has a graduated swivel base, which is adjustable on the table top. A taper pin quickly locates the head in parallel position with the table top, for grinding straight work. A central cam binder at the back of the head is used for clamping the head at the base to the table and an auxiliary cam binder at the left serves to clamp the head to the base and to hold it firmly in position when the central binder is released for the purpose of moving the head on the table. The spindle is hardened and ground and has bearings of taper form, running in hard bronze.

A sectional view of the quill and grinding spindle is shown in Fig. 3. The grinding spindle is driven by two endless belts, ¾ inch wide, and the quill spindle is driven by two pulleys. When the spindle is operating at high speeds a strong suction action is created, insuring a free current of air through the central opening in the spindle. The entire quill-driving mechanism is adjustably clamped to the top of the cross feed slide. Referring to Fig. 3, it will be noted that the casing has a fixed bearing holder inserted in its front end which is secured by a set screw and in its opposite end is an adjustable bearing holder with a threaded adjusting collar. On the central part of the spindle are two collars or flanges which enter an oil reservoir which throws the oil to the walls and roof of the casing. A portion of this oil is received in a long trough which conducts it to felt filtering pads. The oil then flows through conduits to the bearings and spindle and back to the reservoir as indicated by the arrows. Annular recesses in the caps connecting with the channels, provide for the return to the reservoir of any oil which may work beyond the ends of the spindle bearings.

The machine has 15 changes of feed and a throw-out lever, located at the front of the machine, will instantly engage or disengage the feed from the cam mechanism. At the right end of the machine is an indexing lever for locating the cam at exact position at either end of the stroke. The length of the table of this machine is 29 inches, swing 9 inches and the grinder weighs 900 pounds.

A Quick-Acting Vacuum Pot

When the load on a high speed engine varies from no load to full load, the variation in the lift of the vacuum pot plunger is considerable. It is, therefore, extremely difficult to adjust the pot to meet these varying conditions and to obtain good results at all times. In the accompanying illustration is shown a cross-section of a vacuum pot designed by F. B. Miller, 147 Fourth street, Milwaukee, which is intended to afford close regulation and is a positive preventative of leaky valves and insures maximum economy, chiefly for high speed engines.



Cross-Section of the Miller, Quick-Acting Vacuum Pot

Referring to the accompanying illustration, when the plunger, *A*, is released the air which is taken in through the air valve, *C*, is discharged through the check valve, *D*, which is adjustable. As the plunger, *A*, drops, the piston, *B*, takes the thrust without a jolt due to the cushion of air and the spring which readily adapts itself to the varying thrusts of the plunger, but must still be sufficiently strong to act quickly in reseating the piston, *B*. In doing so it forces out the remaining air and causes the plunger to seat instantly. The air valve, *C*, can be adjusted to diminish or increase the amount of air taken into the cylinder to suit the spring.

With these improvements the complete cut-off of the steam valves takes place rapidly and positively, regardless of the variation on the load of the engine, thereby avoiding leaky valves and poor regulation. The quick and more positive seating of the vacuum pot plunger also permits of a smaller lap. Therefore, a greater range of cut-off under the control of the governor is provided with a corresponding increase in the number of horsepower. The noise from the dies, which is largely caused by the necessary amount of clearance allowed between them, is reduced as the seating of the vacuum pot plunger is practically positive and the slight yielding of the spring as the stop on the bell crank touches the drop lever at the end of the travel, makes a position connection with the drop lever.

Iron Production in India

An interesting address on the "Iron and Steel Industry of India" was delivered in New York recently, by Charles P. Perin, consulting engineer of the Tata Iron & Steel Co. This plant, he stated, operates 180 coke ovens of the Coppee non-recovery type. This type of oven was adopted in view of the climatic conditions of India, as the high temperature, ranging from 98 to 110 degrees, renders impossible the condensation of the ammonia by-products with water. It was decided, therefore, that it would be impracticable to attempt their recovery. The volatile content of the coal ranges from 19 to 28 per cent, and its average ash is about 18 per cent. It produces a hard, strong coke. Coal costs $1 a ton at the works and the estimated yield of coke is 75 per cent. Coking costs 67 cents a ton and the total cost of coke in bins at the furnaces will not exceed $2. The cost of limestone and dolomite delivered at the plant is 65 cents a ton, including freight. Women working in the quarries receive about four cents a day, and the men, six cents a day. The cost of pig iron is expected to be somewhat above $6 a ton. The cost of making rails is estimated at slightly over $13.

Of the total output of quicksilver in the United States in 1910, California produced 83.5 per cent. This total constituted the output of 15 mines and amounted to 17,211 flasks of 75 pounds each, valued at $800,484.

Upson Nut Co.'s Steel Works and Rolling Mill

Description of the Open-Hearth Furnaces, Blooming and Merchant Mills, Heating Furnaces, Cooling Bed, etc.

To supply its own finished steel requirements, amounting to approximately 60,000 tons annually, the Upson Nut Co., operating nut and bolt works at Cleveland and Unionville, Conn., began the erection of a steel plant and rolling mill, about two years ago, on a site of 14 acres, located between its Cleveland works and blast furnace on the Cuyahoga river. The purchase of the River furnace from the Cleveland Iron Co. in 1907 was the first move in providing the Upson plants with an independent source of steel supply. Until the completion of the steel works this furnace, which has an annual output of 75,000 tons, produced foundry and steel-making iron which was sold in the open market.

Raw Material Supply.

Throughout his entire business career, the late Andrew Seth Upson sought the control of his raw material supply and this end was finally achieved when the steel plant was placed in operation on Monday, April 10, this year, but unfortunately Mr. Upson did not live to see the realization of the self-contained unit for which he strove, as he died the previous week. The plant has a monthly output of about 12,000 tons of billets, slabs and merchant bars and, in addition to supplying the requirements of the two nut and bolt works, a considerable tonnage of steel is sold in the open market.

Layout of the Plant.

A ground plan of the new steel works and rolling mills, which also shows the blast furnace plant, is illustrated in Fig. 19. The works consist of a steel plant containing four 60-ton open-hearth furnaces, with provision for the erection of a fifth furnace; 34-inch blooming mill and a semi-continuous finishing mill of the Morgan type. The property is bounded by the Erie and the Big Four railroads and is approximately 1,400 feet long and 400 feet wide. The blast furnace plant is built along the bank of the Cuyahoga river, which prevented extension in that direction and the street between the furnace and the steel works involved still further difficulties in the arrangement of the works. The levels of the open-hearth furnace department and the rolling mills were governed by the topography of the ground. The casting side of the open-hearth furnace department, as well as the ingot stripper yard, are on a level of 20 feet above the river, while the blooming mill, finishing mill and the scrap yard are 35 feet above the water line. To obtain the upper level, a large portion of a hill had to be removed which involved the excavation of 750,000 cubic yards of dirt.

As the site was circumscribed, it became necessary to eliminate all possible waste space and the distances between departments had to be reduced to the minimum. The sequence of operations is in practically parallel lines. It will be noted from Fig. 19 that the ingots, after being cast and stripped, are delivered directly to the ingot heating furnace, from which they are conveyed to the 34-inch blooming mill extending in a straight line from the ingot furnaces. The billets are delivered by the billet conveyor to the continuous billet heating furnaces, where the material moves back for the successive finishing operations. The merchant mill building parallels the blooming mill. Owing to property limitations, it was impossible to erect the plant in tandem, but the arrangement is exceedingly satisfactory and effects the same efficiencies that would be obtained from the straight line layout.

Open-Hearth Plant.

Steel is produced in four 60-ton basic open-hearth furnaces fired with natural gas, but arranged to burn producer gas in the event of a failure of the natural

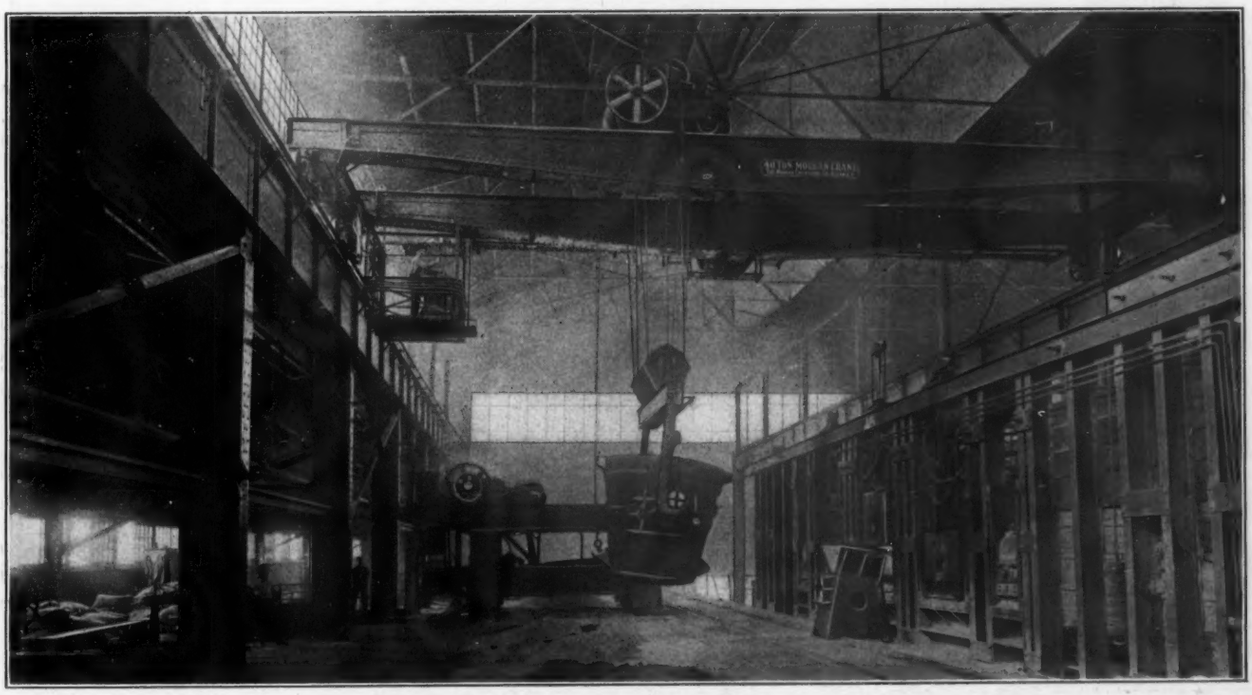


FIG. 1—CHARGING FLOOR OF THE UPSON NUT CO.'S OPEN-HEARTH DEPARTMENT, SHOWING THE LADLE CONTAINING MOLTEN IRON JUST BEFORE TILTING TO DISCHARGE ITS CONTENTS INTO ONE OF THE OPEN-HEARTH FURNACES

FIG. 2—CHARGING SIDE OF THE OPEN-HEARTH FURNACES

gas supply. The open-hearth building is of steel construction with corrugated siding, 408 feet long, 131 feet wide, 87 feet high and 55 feet to the lower chord of the roof trusses. The casting bay is 54 feet wide and the furnace bay, 59 feet. A lean-to, 18 feet wide on the furnace bay side, extends the entire length of the plant. A 30-foot open monitor, the entire length of the building, insures ample ventilation. In addition, there are continuous rows of windows on both sides the entire length of the building, which are 11 feet 4½ inches high. The crane runway commanding the furnace side has a span of 55 feet and the runway in the casting bay is 50 feet wide. The crane runways, which are provided with 100-pound rails, are 40 feet above the level of the casting bay and 20 feet above the charging floor. All of the cranes installed in this department, as well as in other parts of the works, were built by the Morgan Engineering Co., Alliance, O. The hot metal crane in the furnace bay has a capacity of 40 tons and is equipped with a 10-ton auxiliary hoist. The ladle crane in the casting bay is of 100 tons capacity and has a 25-ton auxiliary hoist. As shown on the ground plan, Fig. 19, hot metal from the blast furnace is delivered to the open-hearth furnaces over a track extending into one end of the plant at the end of the charging floor, but on the casting floor level of this department the hot metal is lifted by the 40-ton charging floor crane to the charging floor level, as shown in Fig. 1. This view shows the runner extending through one of the furnace doors and the ladle is about to be tilted to discharge its contents into the furnace. The furnaces are charged by an electrically-operated charging machine, built by the Morgan Engineering Co.

In Fig. 2 is shown the charging side of the open-hearth furnaces, and in Fig. 3 the tapping side is illustrated. As previously stated, these furnaces have

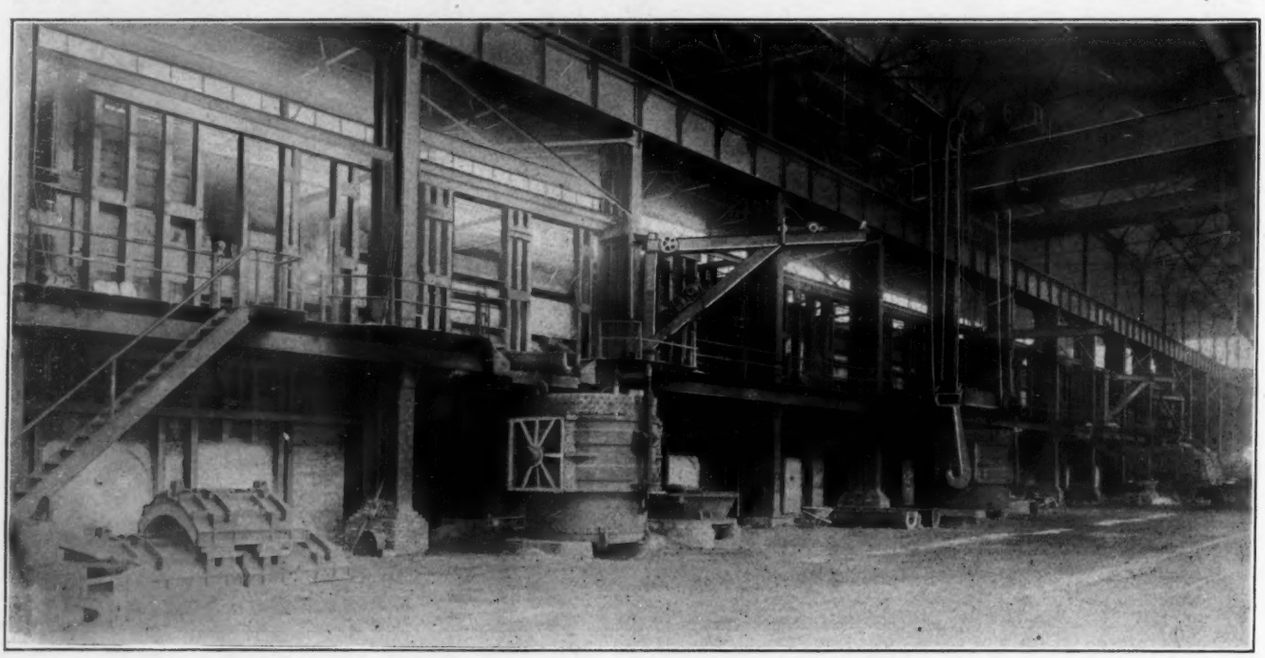


FIG. 3—TAPPING SIDE OF THE OPEN-HEARTH FURNACES

a capacity of 60 tons per heat and the production since the plant has been in operation has averaged, and, at times, has exceeded this tonnage. The furnaces have the same dimensions and are similar in design and construction, and a description of one will be sufficient for the entire installation. The working hearth is 32 feet long, 13 feet 9 inches wide and 4 feet 10 inches deep from the door sill to the top of the bottom plate. The overall or outside dimensions of the furnace are 61 x 16 feet. The furnace has three port uptakes, two for air and one for gas, each being 36 x 36 inches. The gas ports entering the furnace are 30 x 30 inches and the two air ports discharge directly into one large air port over the top of the gas, which is 10 feet wide by 2 feet, 3 inches high. The furnace foundation is 17 feet, 6 inches high from the ground level to the door sills. The main roof rises 20 inches from the skewback. The three charging door openings are 3 feet, 6 inches wide and 3 feet high and four small doors are provided for patching purposes.

Necks from Regenerators to Port Uptakes.

Each set of necks leading from the regenerators to the furnace is 20 feet wide, six feet long and four feet high. The center walls are three feet thick and the side walls and arches are 13½ inches thick. Each neck is bound up on the side with 12-inch steel channels, supported by the foundation walls of the furnace and regenerators.

The furnace bottom is supported on two walls, 4 feet, 6 inches thick, 16 feet wide and 9 feet deep. The division walls between the port uptakes are three feet thick; end walls, 18 inches thick, and the side walls, 13½ inches thick. The port uptake arches are 18 inches thick and are built of silica brick. The gas port arch is 13½ inches thick and consists of three rings of 4½-inch silica brick. The main roof and arch over the top of the gas ports is nine inches thick. The pan or the bottom of the furnace is lined with nine inches of No. 1 fire brick next to the plate, and nine inches of magnesite brick on top of the fire brick. The 18-inch end walls are built of nine inches of No. 1 fire brick and nine inches of magnesite brick. The 13½-inch side walls are built of 4½ inches of No. 1 fire brick and nine inches of magnesite brick. The magnesite brick lining extends 7½ inches above the door sills.

Furnace Bottom.

The bottom of the furnace is supported on nine 24-inch, 100-pound steel beams, which rest on ⅜-inch thick pressure plates and the two 4-foot 6-inch foundation walls. As there are no intervening piers, the space under the bottom of the furnace is absolutely clear for a distance of 24 feet. The furnace is provided with one set of side chills, 6 feet, 3 inches wide, 4 feet, 3 inches high and 16 feet long, riveted together and built of ⅝-inch steel plates and 6 x 6-inch angles. Each chill is braced and riveted and made in one piece. The furnace hearth, back and front, are bound up on each side with fourteen 12-inch steel beams, reinforced at the webs with 2½-inch steel plates. The skewback of the roof has a ¾-inch universal plate extending the full length of the furnace riveted to 12-inch uprights on the hearth and to which a 15-inch steel channel is bolted in short sections equal to the space between the hearth uprights for carrying the roof. The charging door frames are made of manganese bronze, are water-cooled and were installed by the Keystone Bronze Co., Pittsburgh. The charging doors are of the water-cooled type, built by the Knox Pressed & Welded Steel Co., Warren, O. The three charging doors are 3 feet 6 inches wide and are hydraulically-operated from the charging platform.

The port uptakes on the sides and ends are bound with five 12-inch beams on either side and eight 12-inch beams on the ends, and four 12-inch steel channels are used on either side for supporting the skewback and the pressure of the ports. The entire steel work of the furnace from the bottom beams upward is riveted securely and is bound together independently of the brick lining. The steel structure of the entire furnace was erected before any brickwork was built.

Each set of regenerators is 24 feet,

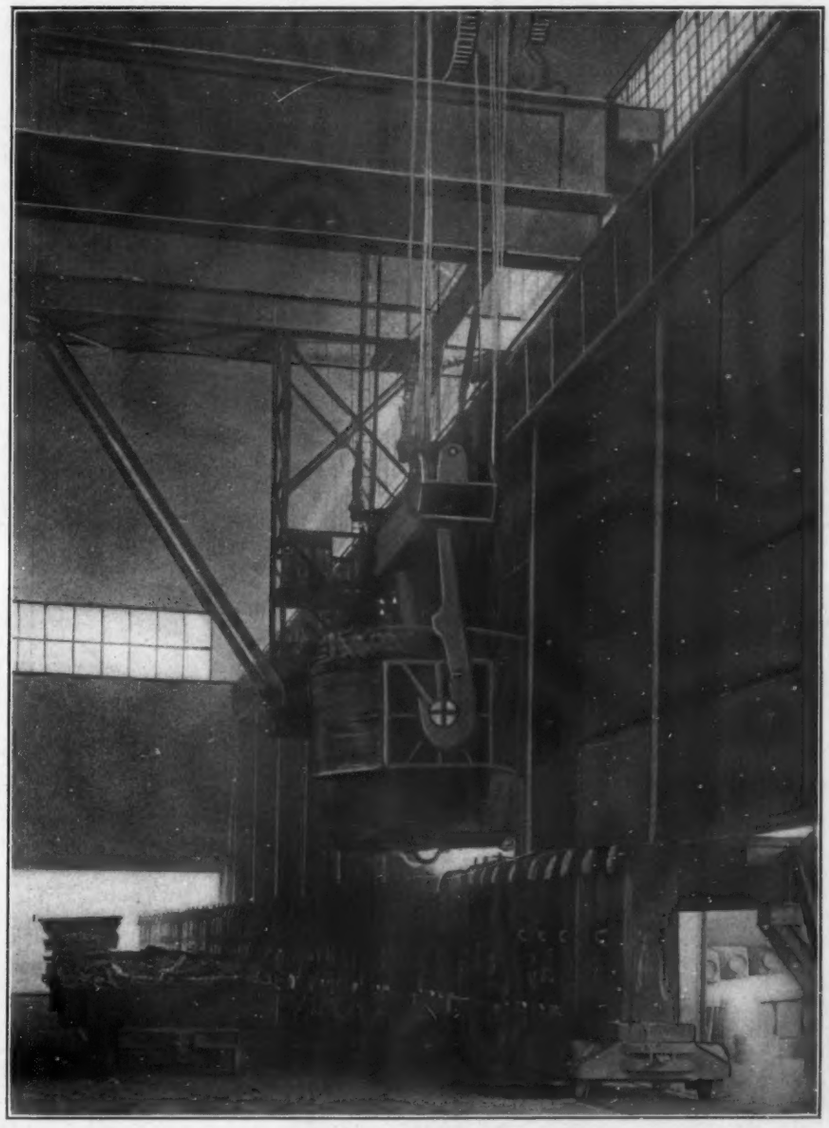


FIG. 4—CASTING STEEL INTO INGOT MOLDS FROM A 65-TON LADLE

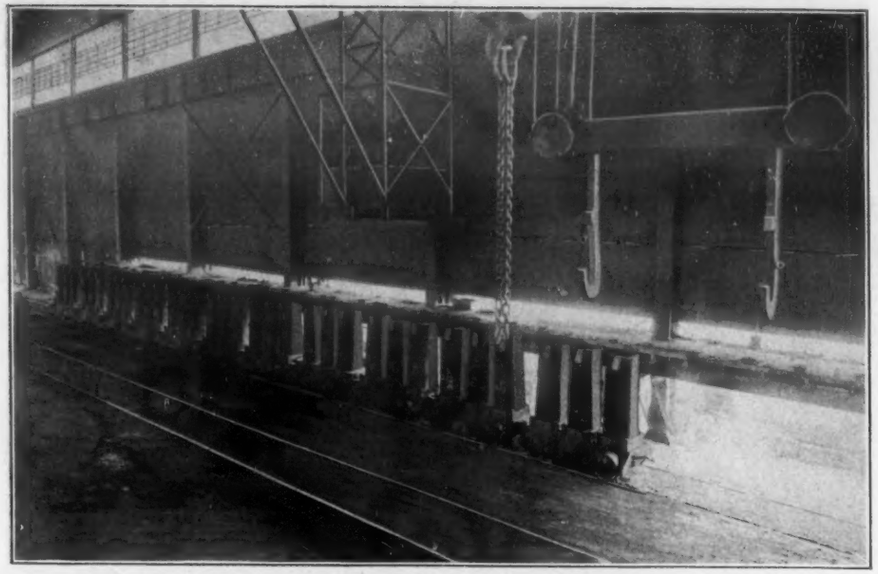


FIG. 5—POURING PLATFORM OF THE OPEN-HEARTH PLANT

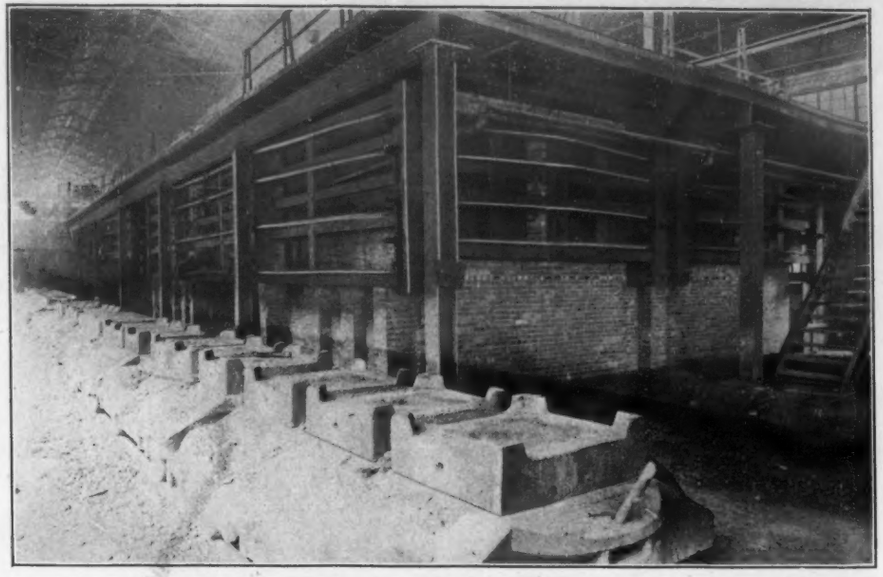


FIG. 6—THE INGOT HEATING FURNACES AS SEEN FROM THE LEVEL OF THE CASTING FLOOR OF THE OPEN-HEARTH PLANT

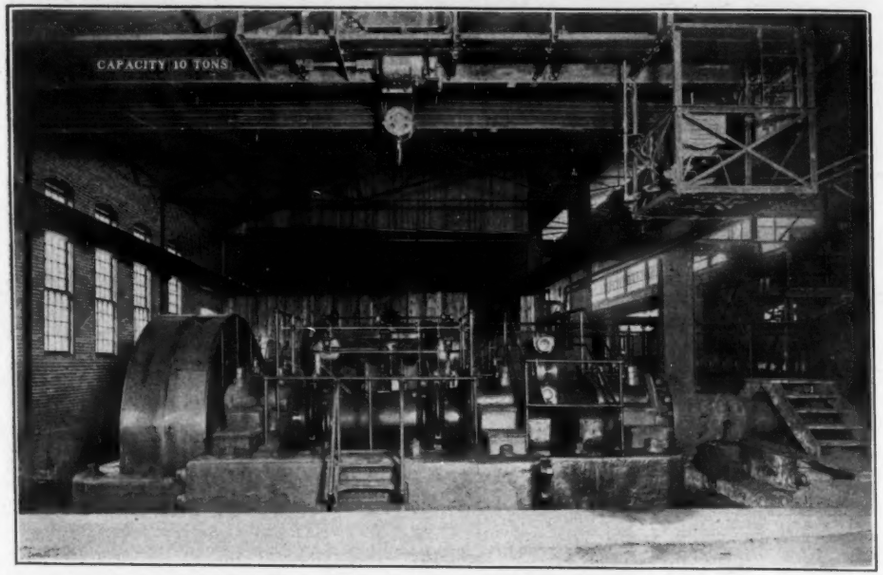


FIG. 7—THE MESTA REVERSING ENGINE WHICH OPERATES THE BLOOMING MILL

FIG. 8—THE 34-INCH BLOOMING MILL, SHOWING THE SCALE CONVEYOR

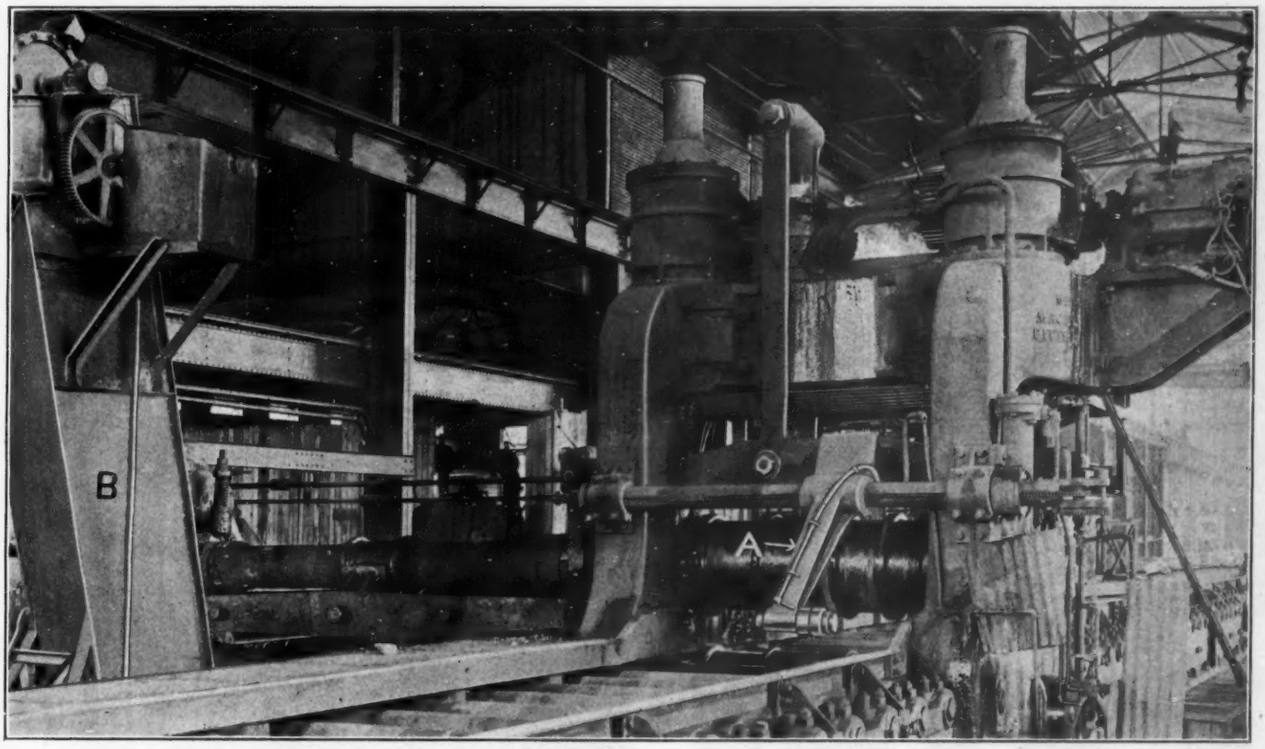


FIG. 9—ANOTHER VIEW OF THE 34-INCH BLOOMING MILL, SHOWING THE AUTOMATIC NUMBERING DEVICE

9 inches wide by 25 feet, 9 inches long. The air regenerators are 12 feet wide and 22 feet long inside and the gas regenerators are six feet wide by 22 feet long inside. The total height from the bottom of the regenerators to the top of the arches covering them is 20 feet. The checkers in all regenerators are 33 courses deep from the top of the rider tile, which is equal to a depth of 12 feet, 4 inches. The space under the rider tile is 2 feet, 6 inches; the division walls between the regenerators are three feet thick, and the arches 13½ inches thick. The sides of the regenerators are bound together by twelve 10-inch steel beams; at the valve end of the regenerators they are held together by seven 10-inch steel beams and on the furnace end by three 10-inch steel beams. The steel work of the regenerators is practically self-supporting from the brickwork.

The air valve flues leaving the regenerators are eight feet wide and the gas flues are six feet wide and 42 inches high. The stack flue is 3 feet, 8 inches

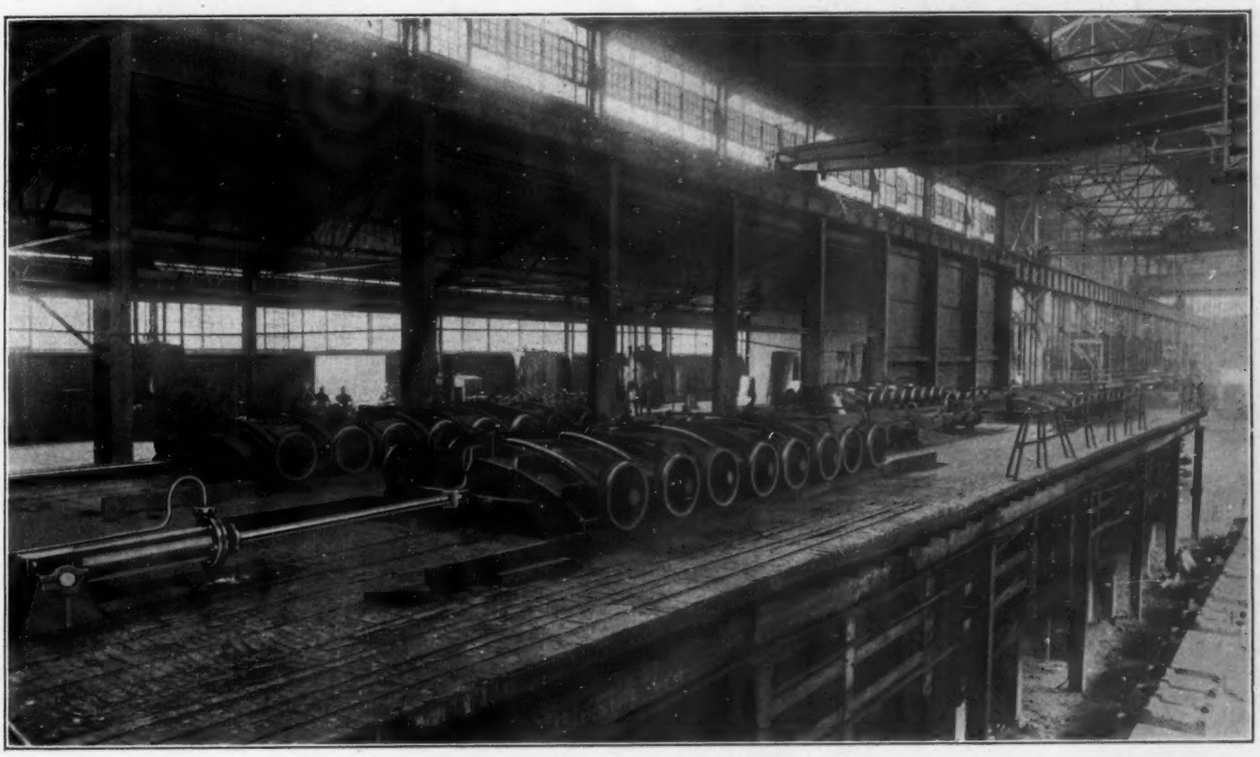


FIG. 10—TOP VIEW OF THE INGOT HEATING FURNACES

FIG. 12—THE TWO CONTINUOUS BILLET HEATING FURNACES

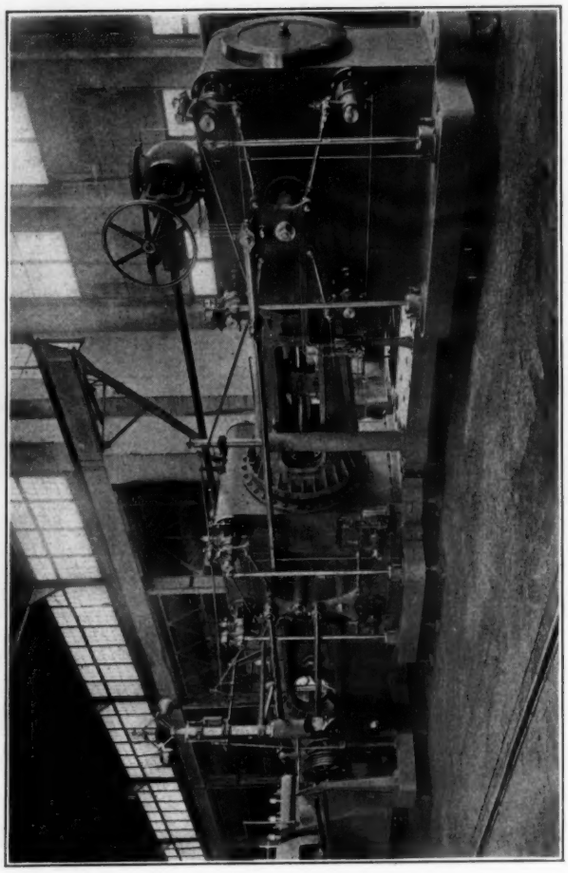


FIG. 14—ANOTHER VIEW OF THE FINISHING MILL ENGINE AS ERECTED IN THE WORKS OF THE BUILDER

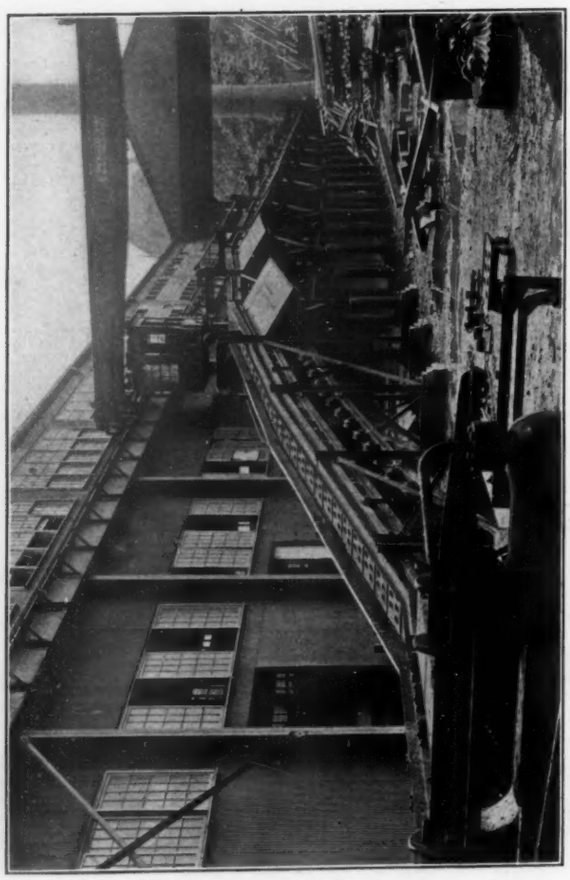


FIG. 11—THE BILLET CONVEYOR AND THE BILLET STORAGE YARD

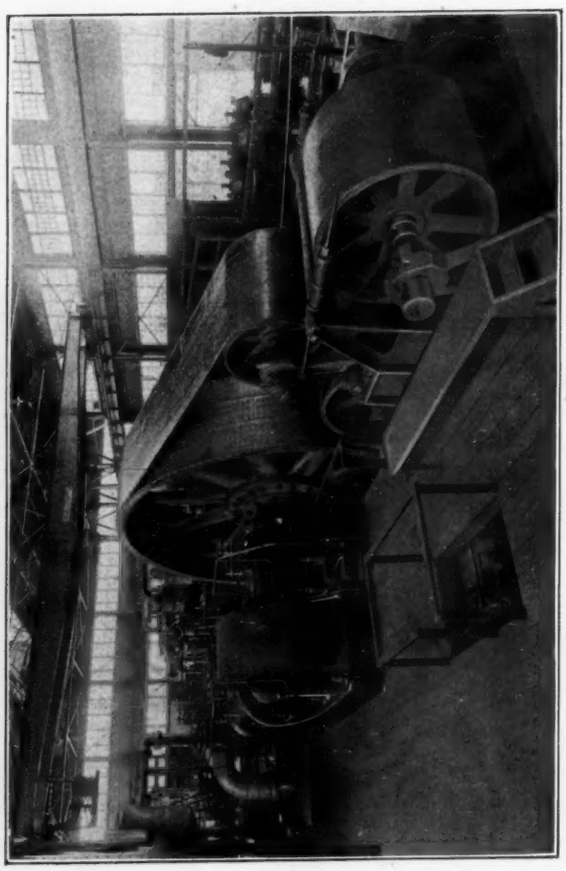


FIG. 13—THE COOPER ENGINE WHICH DRIVES THE FINISHING MILL

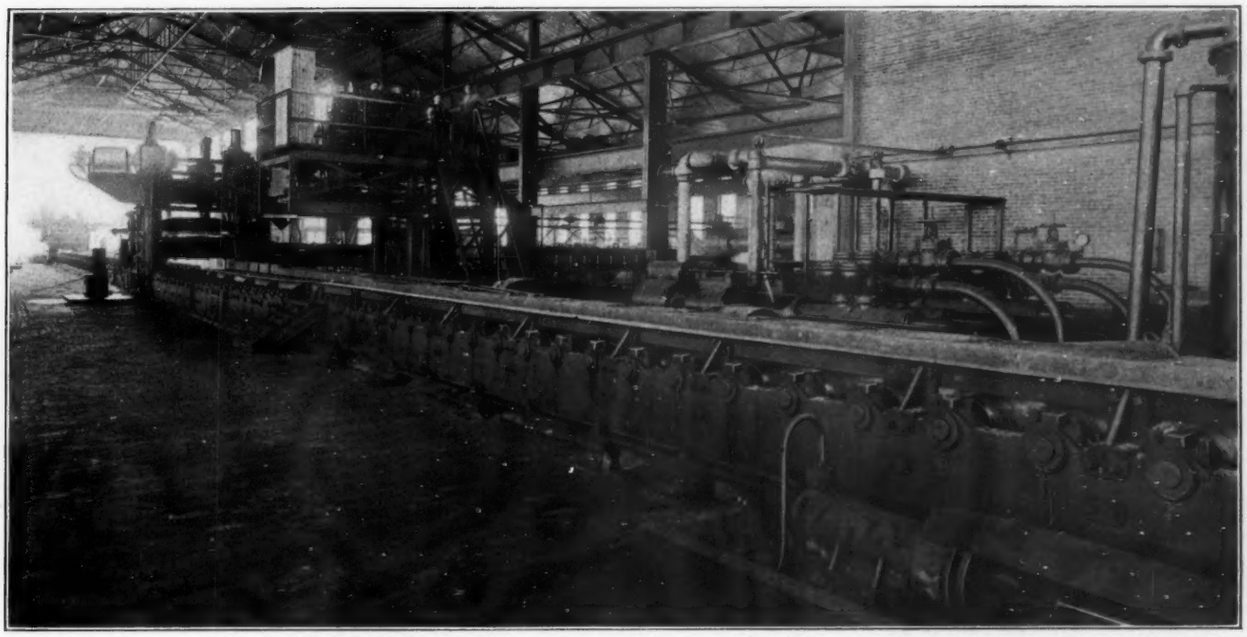


FIG. 15—THE APPROACH END OF THE BLOOMING MILL, SHOWING THE OPERATING PLATFORM

wide by six feet high. The division walls between the air and gas flues are three feet thick. In the top of the valve flues are placed eight cast iron manholes to permit of access to and from the flues for cleaning purposes. The furnace is equipped with a Schild gas valve and a modified Siemens air valve. The air valve is 5 feet by 3 feet, 8 inches in size. The base of the stack is 13 feet, 6 inches square at the bottom by 11 feet, 6 inches square on top and nine feet, full depth. On top of the stack plate is bolted a steel stack, nine feet in diameter at the base, tapering in 15 feet to 6 feet, 6 inches and 150 feet high.

The charging floor is 300 feet long and 67 feet wide, which includes the gangway between the furnaces and a tapping floor, eight feet wide, extending the full length of the four furnaces. The lean-to floor back of the main charging floor is 300 feet long and 18 feet wide. The floor supports consist of two 15-inch steel beams weighing 80 pounds per foot, two beams resting on each column which cross over the regenerators for supporting the 24-inch beams. One 24-inch beam has been placed underneath each track and two under the track at the front end of the charging machine and one at the back end of the main floor, making a total of six 24-inch beams extending longitudinally with the main floor. The gangways between the furnaces and the tapping floor are supported by 45-pound, 15-inch channels. The open-hearth furnaces were built by the S. R. Smythe Co., Pittsburgh.

Each of the open-hearth furnaces is served by an electrically-operated jib crane for handling the tapping spouts. These cranes have a capacity of three

FIG. 16—THE MOTOR-DRIVEN BILLET SHEAR

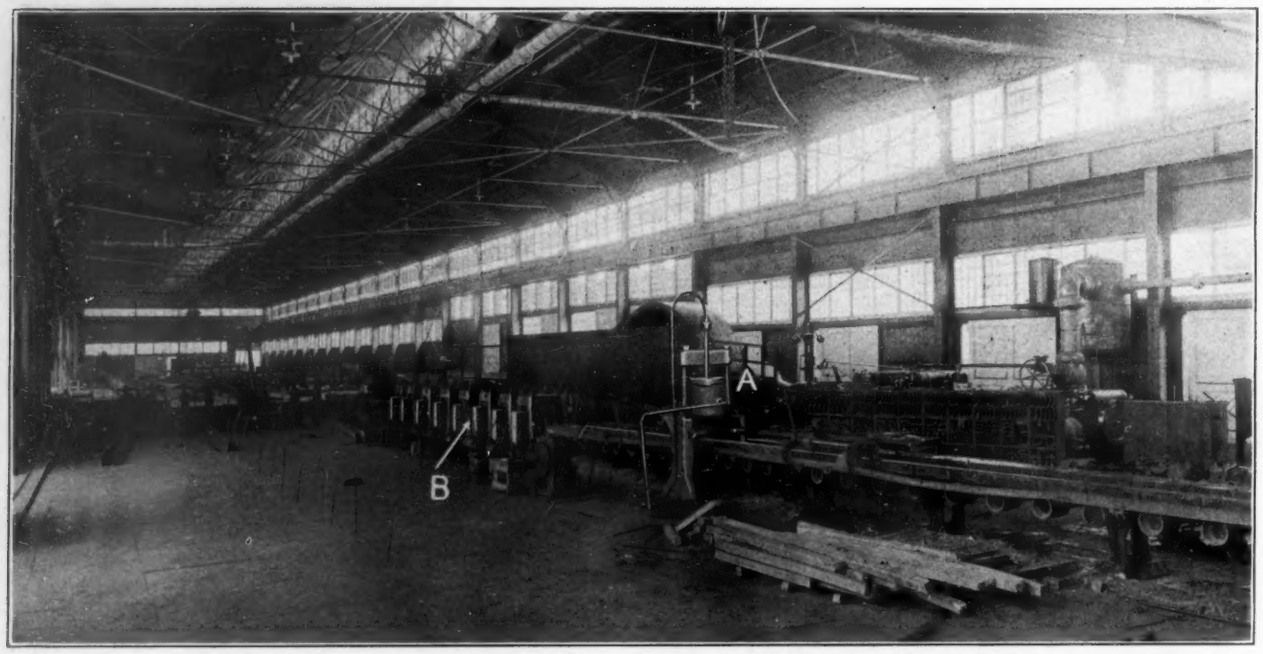


FIG. 17—A VIEW OF THE MORGAN, SEMI-CONTINUOUS MERCHANT MILL

tons and were built by the Johnston & Jennings Co., Cleveland. Each crane has an effective radius of 16 feet and a maximum hoist of 18 feet and is equipped with a limit switch to prevent the over-travel of the hook. The hoisting drum is equipped with a 7½-horsepower motor, electric and mechanical brakes, while the racking movement of the trolley is accomplished by hand chains through gears. One of the special features of this type of crane is that the pintl has roller bearings so designed that they may be brought into absolute alignment after the crane is erected. The 65-ton ladles into which the steel is tapped are set on cradles on the casting floor level and the only pit provided is used when the ladles are to be relined. A run-off attached to the top of each ladle carries off the slag, which flows into a slag pot at the side of the ladle and into which the slag in the bottom of the ladle is also dumped after the ingots have been poured. These pots are supported in pits and after casting a heat are picked up by a crane, set on slag buggies and are conveyed to the stock yard adjoining the open-hearth plant, where they are dumped. The pouring platform is 160 feet long. Two sizes of ingots are cast, 17 x 19 and 20 x 22 inches, weighing, respectively, 5,000 and 7,000 pounds. For moving the ingot buggies on the track into position in front of the pouring platform, an hydraulically-operated car pusher, which is double-acting and has equal capacity in each direction, is employed. The ingot cars used in this department are equipped with forged steel wheels and run on a standard gage track. Each car has a carrying capacity of three ingot molds. These cars,

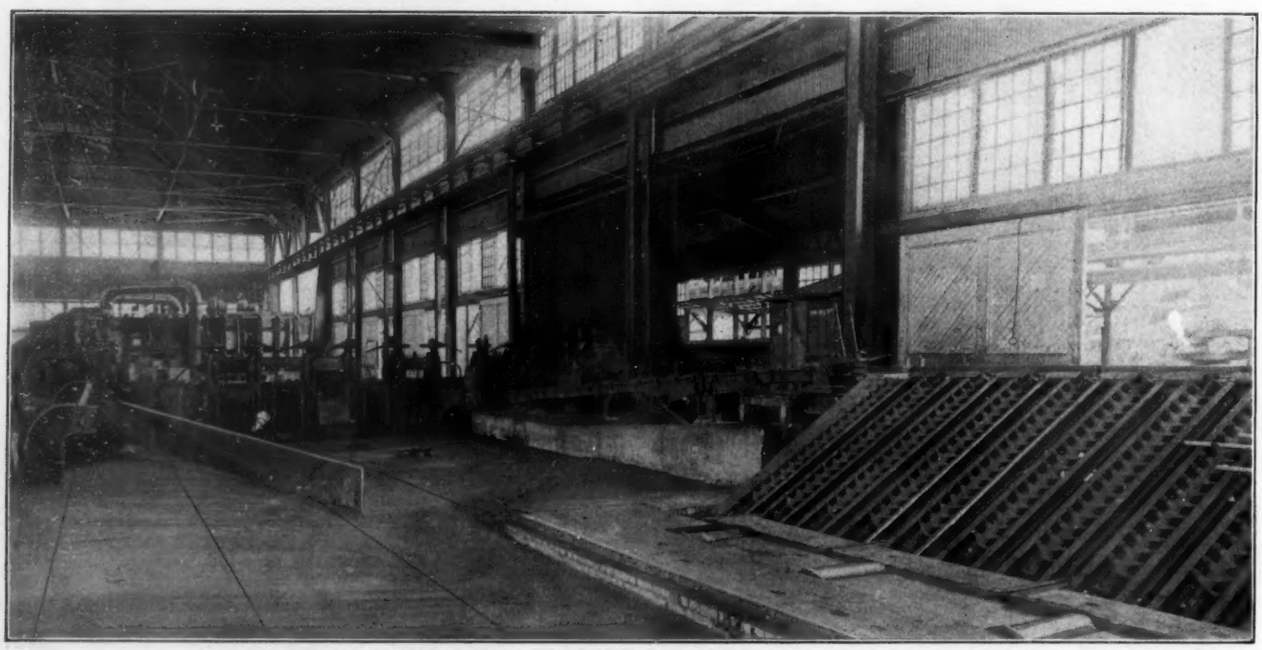


FIG. 18—DELIVERY SIDE OF THE FINISHING STANDS OF THE SEMI-CONTINUOUS FINISHING MILL

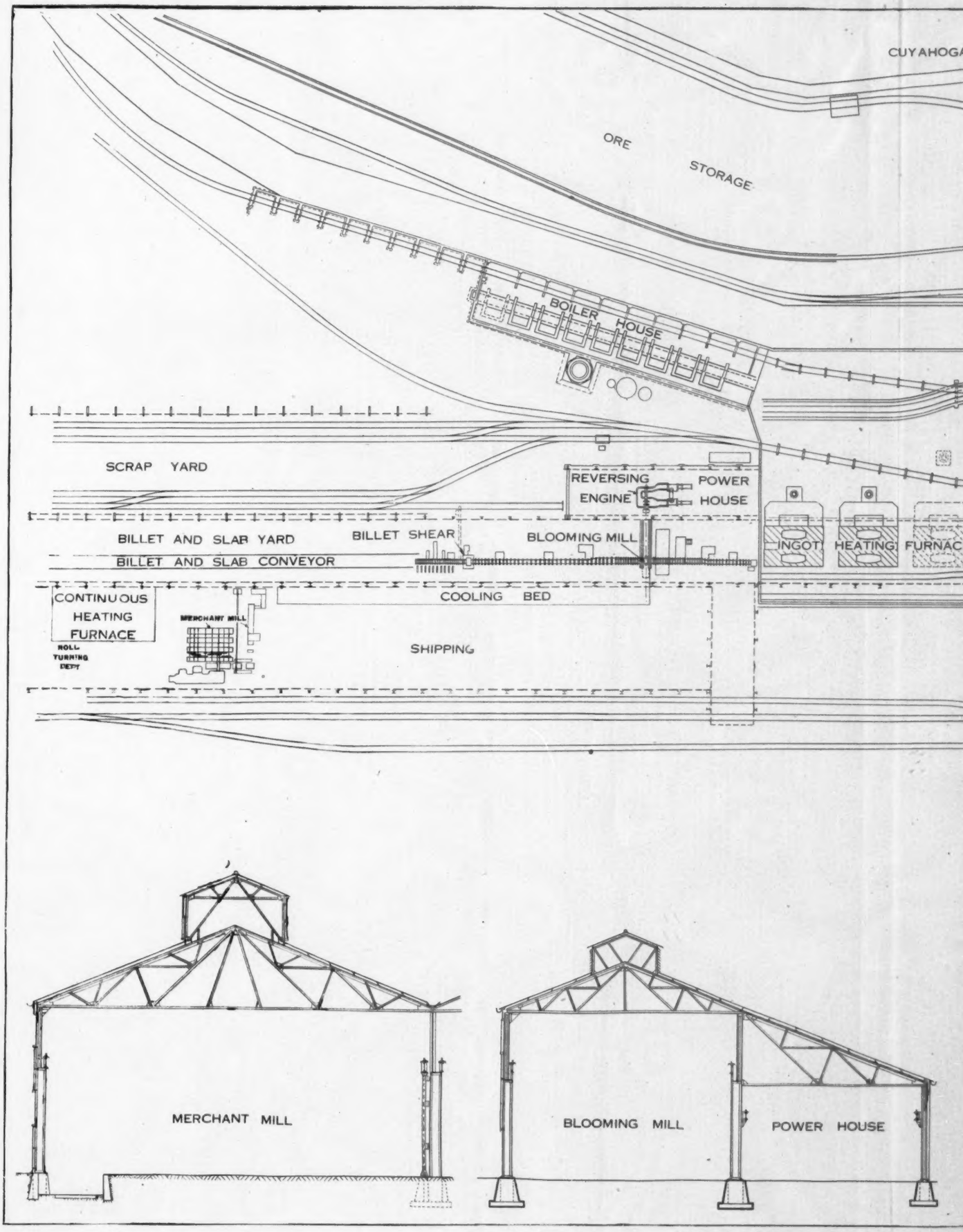
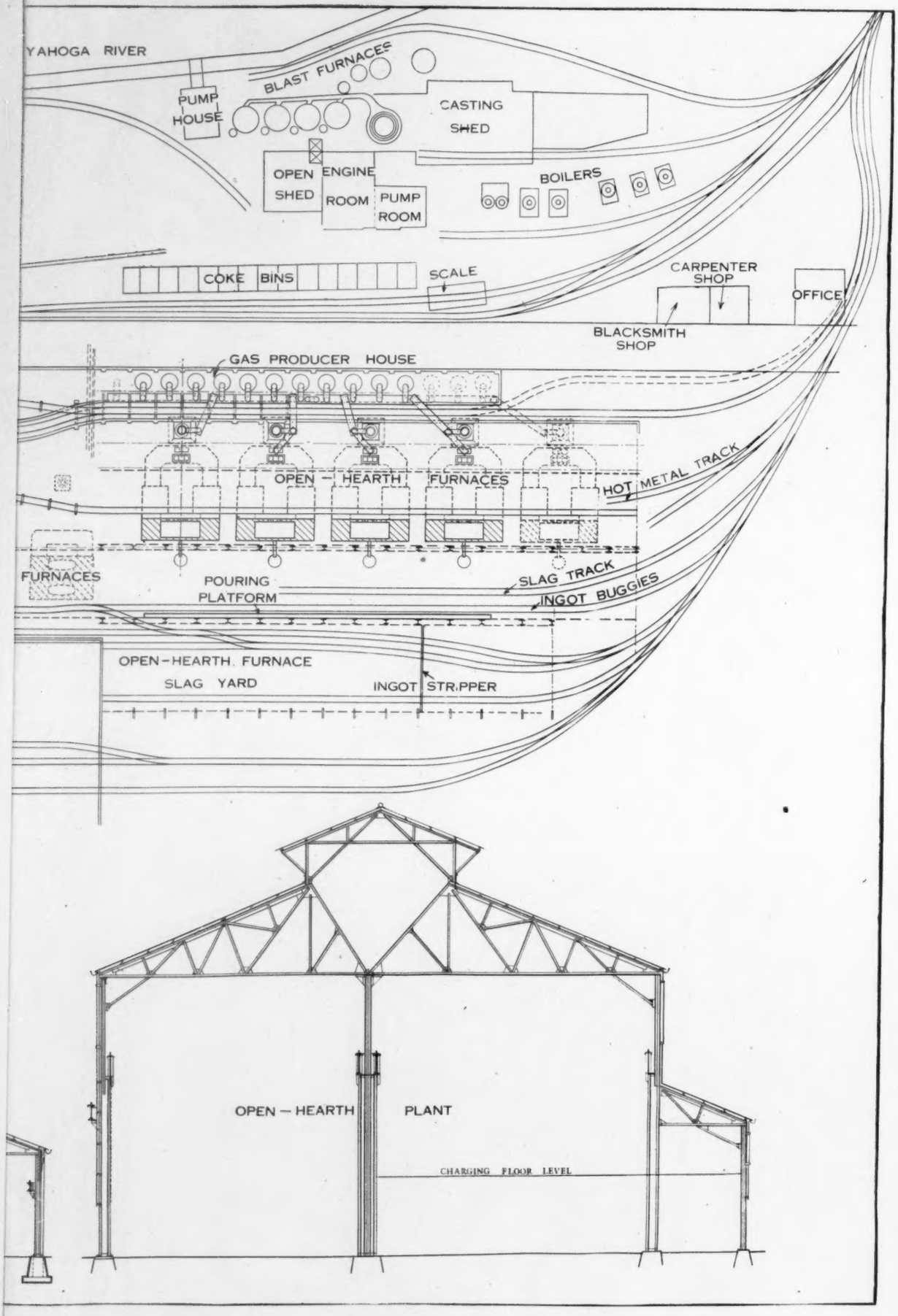


FIG. 19—GROUND PLAN OF THE BLAST FURNACE PLANT, ROLLING MILL AND STEEL WORKS
THE MERCHANT AND BLOOMING MILL BUILDINGS, POWER H

Insert, THE IRON TRADE REVIEW, Nov. 2, 1911.



Works of the Upson Nut Co., Cleveland, and Sectional Views of Power House and Open-Hearth Plant

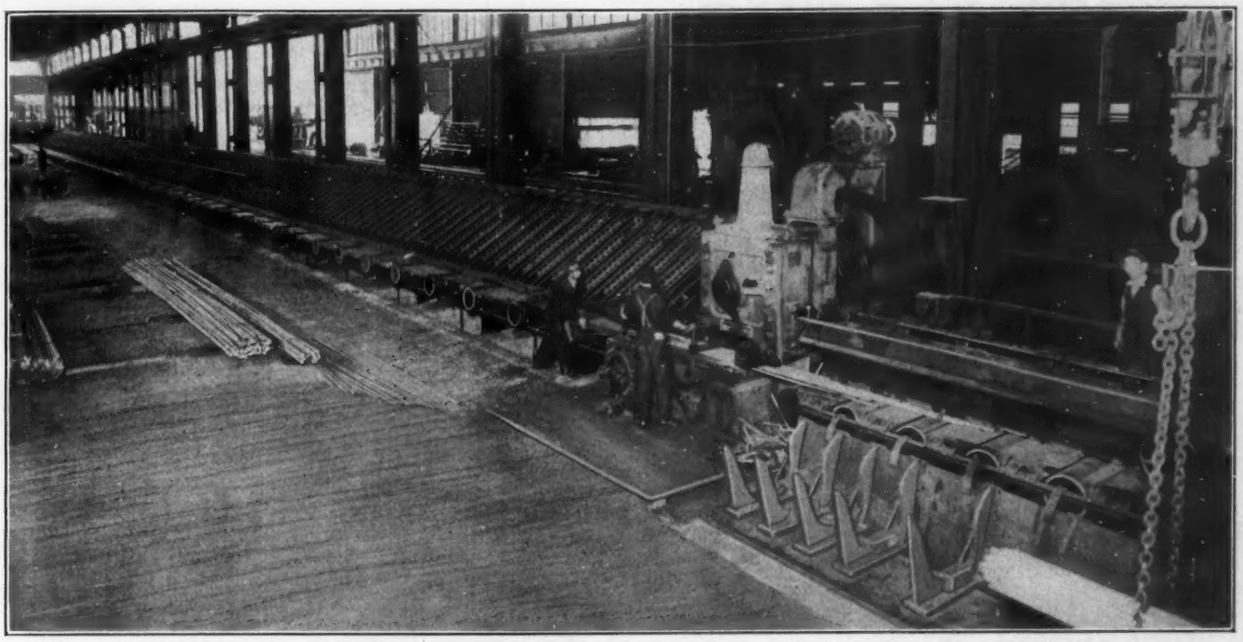


FIG. 20—A VIEW OF THE COOLING BED IN THE MERCHANT MILL, SHOWING THE SHEAR IN THE FOREGROUND

as well as the ingot pusher, were built by the Johnston & Jennings Co.

Stripping the Ingots.

After being poured, the ingots are conveyed to the yard adjoining the open-hearth plant, where they are stripped by an 100-ton ingot stripping crane, installed by the Morgan Engineering Co. This yard, which is on a level with the open-hearth casting floor, is 336 feet long and 65 feet wide. The crane runway, which commands the entire yard, has a height of 30 feet to the top of the rails. In addition to the stripping crane, an electric traveling crane is used for handling ingots and for loading slag onto cars. A lifting magnet, furnished by the Electric Controller & Mfg. Co., Cleveland, is suspended from this crane and is used for lifting the drop for breaking pit scrap, etc. Five standard gage tracks in the yard, with numerous switches, facilitate the movement of ingot buggies and cars, and underneath the stripping crane are two tracks, the one for empty buggies to receive the ingots after they are stripped, and the other for the cars carrying the unstripped ingots received from the open-hearth plant. As a result of the efficient method of disposing of the slag, pit scrap, etc., the tapping side of the open-hearth department always presents an unusually clean and orderly appearance.

Billet Heating Furnaces.

The billet heating furnaces are located in a building which parallels the open-hearth plant and is 180 feet long and 54 feet wide. This structure has a height of 50 feet to the lower chord of the roof trusses and 40 feet to the top of the crane rails. An open monitor, 14 feet wide, extends the full length of the building. The height of this structure to the peak of the moni-

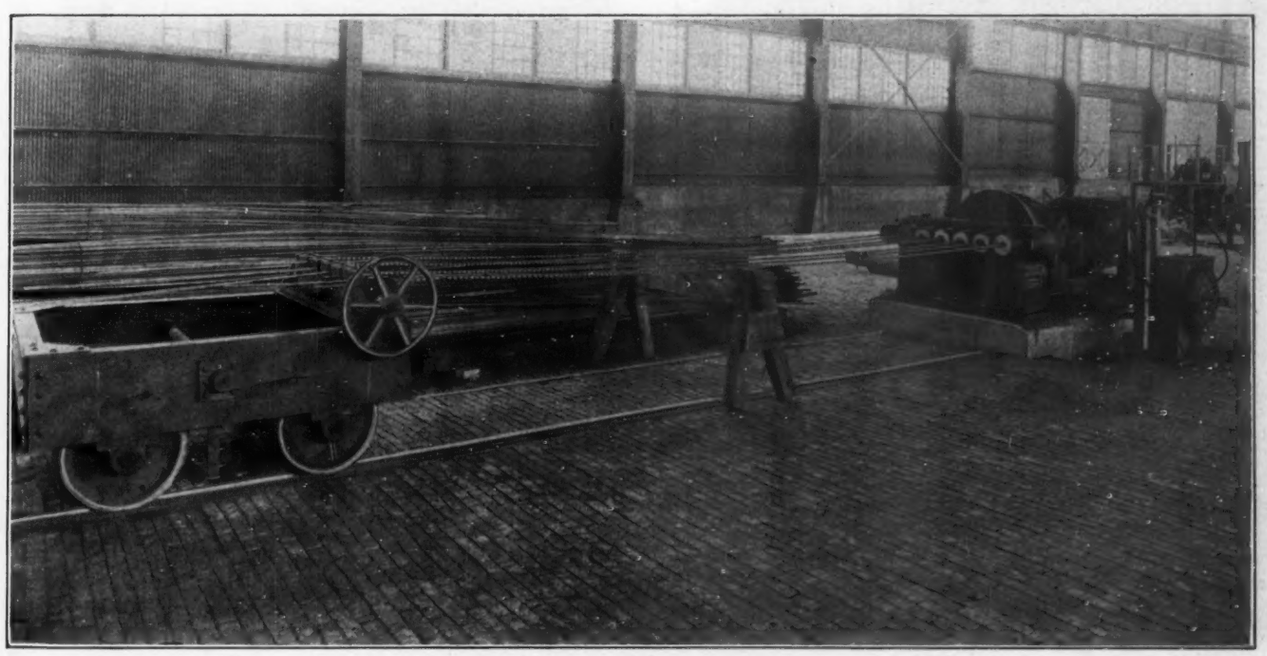


FIG. 21—THE SEVEN-SPINDLE CONCRETE BAR TWISTING MACHINE

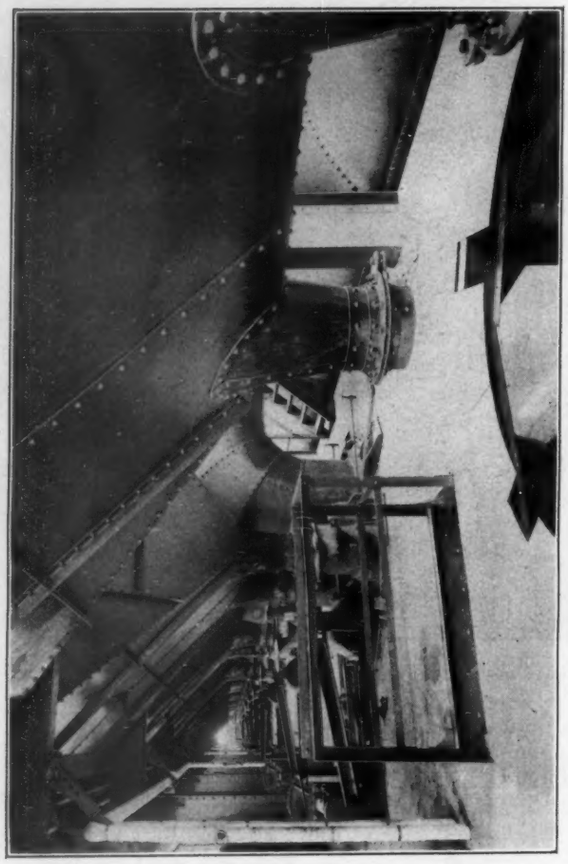


FIG. 23—CHARGING FLOOR OF THE GAS PRODUCER HOUSE

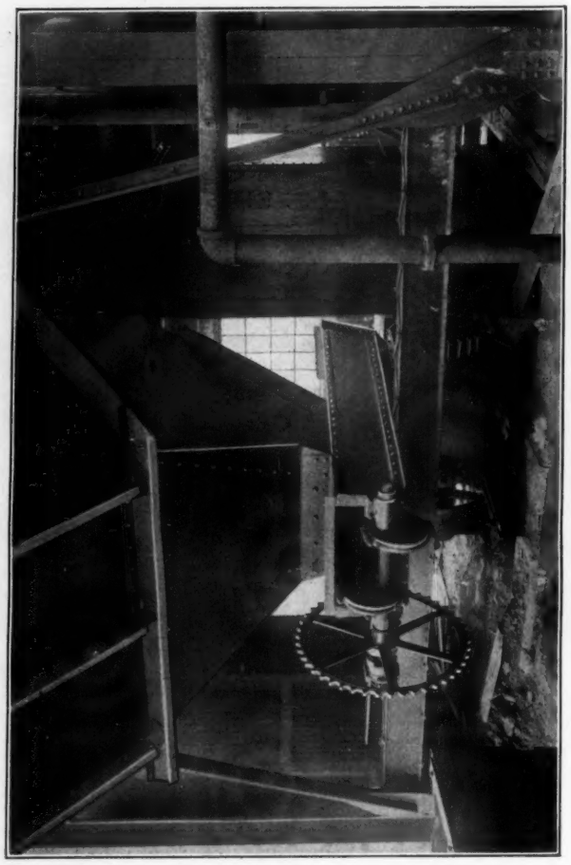


FIG. 25—TRACK HOPPER INTO WHICH THE COAL IS DISCHARGED

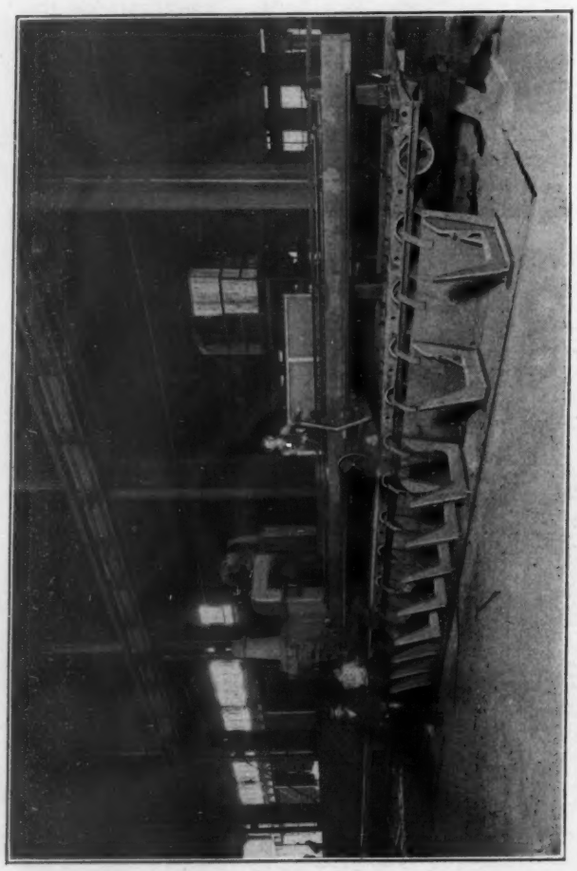


FIG. 22—SHEAR AND THE BUNTLING POCKETS WHICH ARE MOUNTED ON A PLATFORM SCALE

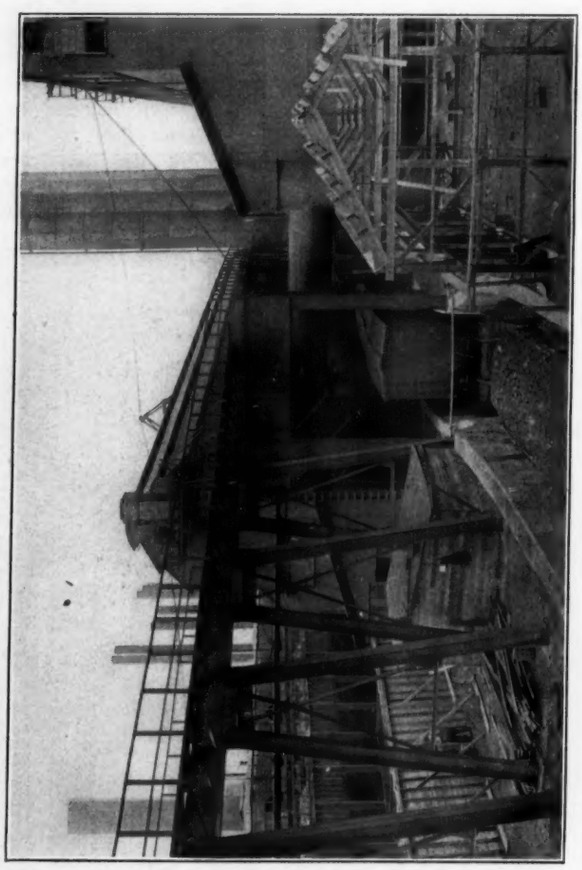


FIG. 24—AN END VIEW OF THE GAS PRODUCER HOUSE, SHOWING THE OVERHEAD TRACK OVER WHICH THE COAL IS DELIVERED TO THE COAL CRUSHER

tor is 68 feet. To provide additional ventilation, continuous rows of lifting windows, seven feet high, have been provided which extend the length of both sides of the building. The four ingot heating furnaces, Figs. 6 and 10, are 20 feet long between ports and seven feet wide. They have a capacity of 22 ingots each and ample space is provided for the installation of two additional furnaces. At the present time, they are fired by natural gas, although provision has been made for the use of producer gas. The foundations of these furnaces are built on the lower level of the steel plant, as shown in Fig. 6, which permits of ready access to the brickwork for repairs. The ingots are delivered to these furnaces over a standard gage track on the lower level and are lifted from the ingot buggies by a revolving pit crane which likewise conveys the heated ingots to the blooming mill. The covers of the furnaces are hydraulically-operated and are divided into four sections which are so manipulated that only one section is exposed when lifting ingots out of the furnace. These furnaces were built by the S. R. Smythe Co.

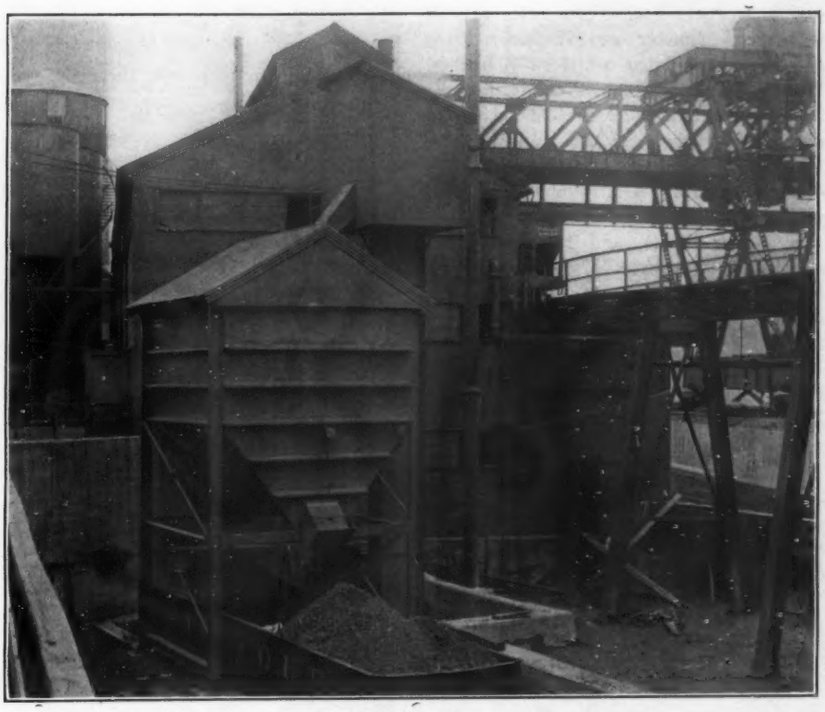


FIG. 27—THE ASH-HANDLING PLANT, SHOWING THE DEPRESSED TRACK

The Blooming Mill Building.

Adjoining the heating furnace building and in a direct line with the open-hearth plant is the blooming mill. This mill building is 276 feet long and 53 feet, 6 inches wide, and the power house, which is on the form of a lean-to, is 161 feet long and 40 feet wide. The total width at the power house end is 93 feet, 6 inches. The height to the peak is 51 feet and 35 feet to the lower chord of the roof trusses. The crane runway is an extension of the runway in the casting side of the open-hearth plant and extends through the heating furnace building. This runway continues through the billet storage yard and has a total length of approximately 1,400 feet. The blooming mill building is unusually well ventilated, the 14-foot monitor, which extends its entire length, being provided with continuous louvres and on one side there is a continuous row of lifting windows, 7 feet, 2½ inches high. For a distance of 142 feet, 6 inches on the merchant mill side, this building is entirely open. The power plant is 20 feet high and is commanded by a 7½-ton electric traveling crane, the crane runway being 37 feet, 2 inches wide and 15 feet high to the top of the rails. The billet yard, which extends in a direct line beyond the blooming mill building, is 322 feet long, 50 feet wide and is commanded by a 15-ton crane.

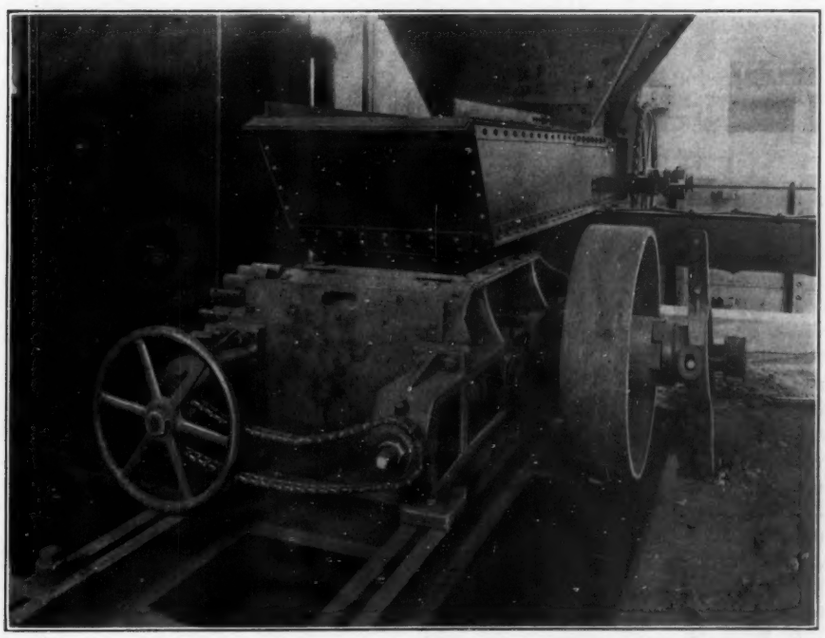


FIG. 26—THE TWO-ROLL COAL CRUSHER

The Blooming Mill.

The 34-inch, two-high blooming mill is illustrated in Figs. 8, 9 and 15. The ingots from the heating furnaces are delivered by the revolving pit crane to an hydraulically-operated ingot tilter which takes an 18 x 20 x 60-inch ingot and delivers it to the ingot approach table. This table is 46 feet long and contains 26 rollers driven by a 37½-horsepower, mill type motor. This approach table, showing the operating platform and the blooming mill, is illustrated in Fig. 15. From the approach table the ingot passes to the reversing mill table which is 47 feet long from the center line of the mill on the entering side and contains twenty-four 12-inch rollers, driven by a 100-horsepower motor. The delivery side is 43 feet long and contains eighteen 12-inch rollers, driven by a 100-horsepower motor. The rollers have a peripheral speed of about 124 feet per minute. The entering side of the mill is provided with a manipulator which turns the ingot as it passes back and forth through the mill. The mill is equipped with a hydraulic roll balance and the screws are operated by a 60-horsepower motor through worms

and a worm wheel. The rolls are 29 inches in diameter and 75 inches long and the top roll has a lift of 20 inches. The intermediate spindles connecting the rolls and the pinions are 18 inches in diameter at the wabbler and 14 feet long. The pinions are 29 inches in diameter and 7.6-inch pitch. The mill will roll 18 x 20-inch ingots down to 4 x 4-inch billets, and has a capacity of about 800 tons. This mill is driven by a 34 x 60-inch Mesta direct-connected reversing engine, illustrated in Fig. 7.

The runout and shear approach table is 98 feet, 6 inches long and contains 34 rolls, driven by two 25-horsepower motors. This table connects the mill tables with the shear and is used as a runout table for the long billets and as an approach table to the shear. The shear, Fig. 16, is of 400 tons capacity, has a stroke of 12 inches and is driven by a 75-horsepower motor. The gage, which is hydraulically-operated, is arranged so that pieces from two to ten feet long may be cut. The shear runout table is 45 feet, 6 inches long and contains 44 rollers, driven by a 37½-horsepower motor. A portion of this table next to the shear is supported on trunnions and is operated by hydraulic cylinders so that it may be tilted to accommodate the size of the piece that is being cut. In addition, the two last rollers in the tilting section may be swung down to permit the crop ends of the billets to pass on and fall down a chute to the crop conveyor underneath the table. The part of this table farthest from the shear is provided with an hydraulically-operated push-off, which pushes the sheared billets from the table into the loading cradles. The operating pulpit from which the mill screw-down and manipulators are operated, is located above the mill table on the entering side of the mill. The entire blooming mill equipment, including the reversing engine, tables, shear, manipulators, etc., was intsalled by the Mesta Machine Co., Pittsburgh.

In Fig. 8 is illustrated a scale conveyor, *A*, which conveys the scale from the pit underneath the blooming mill and delivers it by a bucket conveyor into a chute, from which it falls into a perforated bucket which permits the water to flow off. This conveyor has proved its efficiency and prevents the accumulation of scale in the pit. Another view of the scale conveyor is shown at *B*, Fig. 9. For numbering the billets on the finishing pass, an hydraulically-operated numbering device, *A*, Fig. 9, has been provided. The heat numbers are inserted in a circular disc carried on the projecting arm. This disc is approximately eight inches in diameter and as the heat number is inserted twice in its circumference the billets are uniformly marked every 12 inches. Regardless of the length to which the billets are cut, the heat number will be indicated on each section and, in addition, the inadequate method of stamping each billet by hand has been eliminated.

After the billets, slabs, etc., have been cut, they are delivered to a billet conveyor, Fig. 11, installed by the C. O. Bartlett & Snow Co., Cleveland. The billets and slabs are carried up and discharged in piles along the full length of the conveyor on the billet yard side. This conveyor is approximately 340 feet long. At the billet heating furnace end gates are provided for discharging the billets into skids entering these furnaces, to be reheated for the merchant mill. The conveyor has been equipped with a gate at one end for discharging the billets and slabs directly into cars. The conveyor consists of heavy cast steel pans carried on eight-inch, self-oiling rollers, and is driven by a 35-horsepower motor. The steel framework is protected by heavy cast iron pipes filled with concrete up to a height of six feet from the ground level along the side of the conveyor,

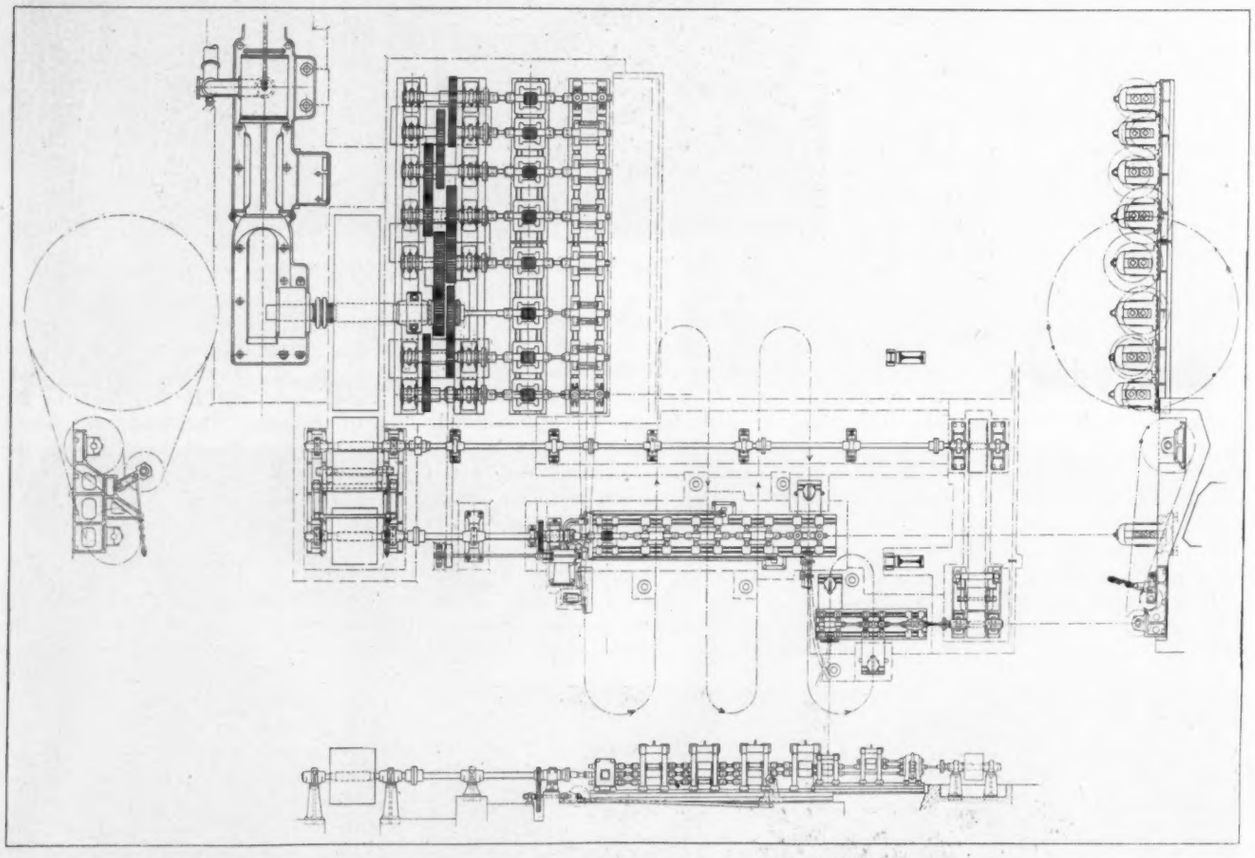


FIG. 28—SIDE ELEVATIONS AND PLAN VIEW OF THE MORGAN SEMI-CONTINUOUS MERCHANT MILL

where the billets and slabs are discharged. The conveyor has a speed of approximately 40 feet per minute and is equipped with a sprinkler system for cooling the billets and slabs while they are being conveyed. The receiving end of the conveyor is equipped with dead rolls, plates, etc., for the proper discharge of the billets from the shear table.

Conveyor for Crop Ends.

For handling the crop ends from the blooming mill shear a scrap conveyor has also been installed by the C. O. Bartlett & Snow Co. The crop ends are discharged directly from the shear into a chute and onto an inclined conveyor, which carries them up and discharges them into open-hearth furnace charging boxes so that they can be delivered directly to the open-hearth furnaces without rehandling. The conveyor consists of a heavy cast steel apron, over which the crop ends are dragged by means of bars moved at either end by the forged steel roller chains. The conveyor is of heavy construction throughout and is motor-driven.

Billets not intended for storage or shipment are delivered direct to two Morgan continuous heating furnaces, Fig. 12. These furnaces are of the gravity discharge type, into which the billets are automatically charged, heated and discharged onto a motor-driven table leading to the roughing stands of the merchant mill. Before reaching the roughing mill, this table conveys the billets through an hydraulically-operated dividing shear so that 11-foot billets are used in the rolling of nearly all sections, the requisite reduction in weight being accomplished by cutting the heated billets into one, two, three, four or even five sections. This shear is illustrated at *A*, Fig. 17, which is a view of the semi-continuous merchant mill.

Merchant Mill.

After the billets are heated, they are delivered to a Morgan merchant mill, which has an annual capacity of 75,000 tons of finished bars from ⅜ to 1⅜-inch rounds and equivalent sections. After leaving the dividing shear, the 4-inch billets pass through the eight-train, 14-inch roughing mill in one of the several different lines of passes so as to deliver any desired shape or size of billet to the 11-inch mill for finishing. The roughing mill is shown at *B*, Fig. 17. The 11-inch train finishes down to ¾-inch rounds and equivalent sections and for sizes between ¾ and ⅜ inch, two additional stands of 8-inch rolls are employed. This finishing train is illustrated in Fig. 17 and the delivery side is shown in Fig. 18.

The finished material from either the 11-inch or the 8-inch train is run out onto a 300-foot, inclined, automatic cooling bed, Figs. 18 and 20, on which it is cooled and fed in groups to the shear, Figs. 20 and 22, where it is cut accurately to length, after which it is pushed off into bundling pockets, Fig. 22, mounted on the platform scale, ready to ship. A pair of motor-driven traction reels is provided for reeling rounds, ¾ inch and smaller in diameter and equivalent sections, whenever it is desired to have these sizes in coils. The engineering for the complete mill was done by the Morgan Construction Co., Worcester, Mass., which also built and installed the entire equipment.

Mill Drive.

The mill is direct-driven by a 32-inch and 54 x 60-inch tandem compound condensing Corliss engine, built by the C. & G. Cooper Co., Mt. Vernon, O. The engine, as installed, is shown in Fig. 13, while Fig. 14 shows the engine without the flywheel, as erected in the works of the builder. The engine is the standard rolling mill type, built by this company recently for several large steel works and some of the distinctive features of design include the massive construction of the bed plate to provide increased strength underneath the main journal; the location and construction of the distance piece between the cylinders so that it can be easily and quickly removed in top and bottom sections and is of sufficient length to allow ample accessibility for the inspection of both cylinders. The deep subbase, extending from the main frame under the entire engine, keeps it in alignment independently of the foundations. The steam and exhaust valves of the high pressure cylinders are operated by a single eccentric and those of the low pressure cylinders on independent eccentrics. The releasing mechanism of the valve gear is one of the most important mechanical features of this engine. This releasing gear is of the Cooper improved, gravity-inertia latching type, which has been successfully used on engines of higher rotative speed and under conditions of wide variation in load, as it is especially adaptable to such conditions of operation. The governor is of the weighted inertia type and is driven by three one-inch ropes. It is arranged so that in case of accident to the governor, the steam valves would not be permitted to open and the engine would shut down. The band wheel is 22 feet in diameter, 62 inches face and weighs 132,000 pounds.

The merchant mill building parallels the blooming mill, billet conveyor and billet storage yard, and is 598 feet long, 85 feet wide, 63 feet high and 35 feet to the lower chord of the roof trusses. A monitor, 21 feet, 3 inches wide, containing two rows of continuous windows provided with balanced sash, extends the length of the building. A standard gage shipping track runs into the merchant mill at one side. The crane runway has a span of 82 feet and the material is handled by two 15-ton cranes.

Bar Twisting Machine.

A bar twisting machine for reinforcing bars for concrete construction, shown in Fig. 21, built by the United States Engineering & Foundry Co., Pittsburgh, forms a part of the equipment of the merchant mill department. This is a seven-spindle, motor-driven machine and is equipped with a dial for regulating the number of twists given the bars. These bars are secured at one end in a vise attached to a truck operating on a track to facilitate the twisting of bars of any length. For cutting scrap, a motor-driven alligator shear, built by Thos. Carlin & Sons, Pittsburgh, has also been installed.

The roll turning department for the merchant mill is located at the heating furnace end of this building, as shown in Fig. 19, and the equipment consists of a 26-inch, belt-driven lathe for turning guide and bar rolls for 20-inch trains and under, furnished by the United Engineering & Foundry Co., Pittsburgh, as well as a Morgan belt-driven lathe. The roll turning lathe for the blooming mill is located in the blooming mill building. This lathe is driven by a 25-horsepower, adjustable speed motor and was furnished by the Mesta Machine Co.

Scrap Yard.

The scrap yard adjoins the billet storage yard and is 322 feet long and 80 feet wide. It is commanded by an overhead electric traveling crane of 10 tons capacity and is equipped with lifting magnets, furnished by the Electric Controller & Mfg. Co., Cleveland. The scrap is unloaded from cars in this yard, cut to length, and the charging boxes are filled for delivery to the open-hearth furnace department. The scrap is cut by a lever shear, equipped with an electrically-operated stop-motion clutch, built by the United Engineering & Foundry Co. The charging box buggies operate on standard gage tracks which connect with an elevated track connecting with the charging track on the charging floor.

The boiler house, shown in the ground plan, Fig. 19, is 233 feet long and 48 feet, 9 inches wide. The boilers are set on 23-foot centers, the foundations being on the lower level of the plant. The equipment consists of eight Sterling boilers of 510-horsepower capacity each,

with provision for the installation of another boiler. The coal is discharged from cars into bins equipped with spouts leading to the stokers, installed by the McKenzie Furnace Co., Chicago.

Gas Producers.

The gas producer house parallels the open-hearth building and is separated from it by a depressed track, which is utilized for the shipment of ashes from the gas producer house and the boiler plant and also for the delivery of raw material such as fire brick, etc., to the open-hearth plant. The gas producer building is 300 feet long, 18 feet wide, 42 feet high and 33 feet to the lower chord of the roof trusses. The gas-making equipment consists of 11 Hughes producers, installed by the Wellman-Seaver-Morgan Co., Cleveland. Three of the producers will furnish gas for the ingot heating furnaces and eight have been provided for the open-hearth furnaces. The producers for the open-hearth furnaces have been so arranged that they can be operated in batteries of four, or they can all be connected together as desired. A view of the charging floor of the gas producer house is illustrated in Fig. 23, while Fig. 24 shows one end of this building with the elevated track from which the coal is discharged from cars into the chute leading to the coal crusher.

Coal-Handling Plant.

The coal-handling plant for the producer house was built by the C. O. Bartlett & Snow Co., Cleveland, and consists of a track hopper into which the coal is discharged from hopper bottom cars. This track hopper is provided with a feeder of the plunger type for feeding the coal into a two-roll crusher, shown in Fig. 26. This crusher has 24 x 24-inch rolls provided with steel-tooth segments. It is arranged to by-pass the coal through the crusher by separating the rolls, in which case the feeder acts as a feeder to the elevator which carries the coal from the crusher to a steel flight conveyor. This conveyor distributes the coal in the hopper which extends the full length of the producer house. The bottom of this hopper, with its discharge spouts to the gas producers, is shown in Fig. 23. The plant has a capacity for handling 50 tons of coal per hour. The elevators, conveyor, crusher, etc., are operated by independent alternating current motors.

The ash-handling plant for the boiler house, Fig. 27, built by the C. O. Bartlett & Snow Co., consists of an elevator and an ash bin. Ashes are taken from the ash hopper underneath the stokers of the boilers in small industrial cars and are discharged into a bucket elevator which delivers the ashes to a steel bin having a capacity of 50 tons. This bin is provided with two gates and chutes for discharging ashes into cars on a track directly underneath the bin. This arrangement is clearly shown in Fig. 27.

Power Plant.

The equipment of the power plant consists of two Curtis turbines which drive two 750-kilowatt alternating current generators, built by the General Electric Co., Schenectady, N. Y. One of these turbines is of the mixed pressure type and the other is a high pressure machine. The mixed pressure machine is driven by the exhaust steam from the blooming mill engine, which is passed through a Rateau regenerator. Two synchronous sets for converting the alternating to direct current for the crane motors also forms a part of the equipment. The electric power for the Upson nut and bolt works, blast furnace and the steel works is generated by the two 750-kilowatt machines. For the merchant mill engine and for the turbines two Helander condensers were furnished by the Mesta Machine Co. The hydraulic power is furnished by two compound hydraulic pumps working under 500 pounds pressure, built by the Epping-Carpenter Co., Pittsburgh, and the 18-inch accumulator was furnished by the Morgan Engineering Co. A De Laval high pressure centrifugal boiler feed pump forms a part of the equipment of the boiler plant. In the pump house have been installed three De Laval electrically-operated pumps of 5,000,000 gallons capacity each, two of which operate at a head of 100 and one at 40 feet. Practically all of the mill and crane motors were installed by the Westinghouse Electric & Mfg. Co., Pittsburgh.

Controllers.

The controlling apparatus on the cranes, mill tables, etc., is of modern mill type design and was furnished by the Electric Controller & Mfg. Co., Cleveland. In the open-hearth department the charging machines, ladle crane, stripper crane and other lighter cranes are equipped with Dinkey ventilated controllers. Other cranes in the blooming mill, power house, finishing mill, stock yards, etc., are also provided with these controllers, making a total of 46 crane motors of an aggregate of 1,175 horsepower so equipped. With the exception of some of the smaller mill tables, which are equipped with ventilated controllers, the various mill motions are regulated by magnetic switch controllers installed by the Electric Controller & Mfg. Co. This equipment consists of two 100-horsepower, two 37½-horsepower and two 25-horsepower magnetic switch controllers for the tables and one 60-horsepower magnetic switch controller for the screw-down. These magnetic switch controllers incorporate the Electric Controller & Mfg. Co.'s series wound, type A switch, which eliminates entirely the use of relays, auxiliary contacts and small control wiring. In the stock yard two 52-inch lifting magnets, furnished by the Electric Controller & Mfg. Co., are used for loading and unloading billets, pig iron and scrap. A locomotive crane and an electric overhead traveling crane are used to handle these two magnets. A 43-inch magnet, furnished by this company, is also used for handling the drop ball for breaking pit scrap, etc. This magnet also serves to pick up and remove the pieces of scrap after they have been broken.

All of the buildings are of steel construction, sheathed with corrugated puddled iron. The producer and boiler houses were built by the Variety Iron Works, Cleveland, and the open-hearth, heating furnace, merchant mill and other buildings were built by the Riter-Conley Mfg. Co., Pittsburgh.

The plant was designed and built under the supervision of E. H. Martin, general manager of these works, and he was assisted by L. S. Schmidt, mechanical engineer, now associated with the Knox Pressed & Welded Steel Co., Warren, O. The field work was done by Charles Ingersoll.

Electric Furnaces in Norway

In a paper presented at the Toronto meeting of the American Electro-Chemical Society, Prof. Joseph W. Richards, of Lehigh University, gave a description of the electro-chemical plants in Norway, which he visited while abroad. Speaking of the electric smelting of pig iron, he stated that at Hardange two electric furnaces, the design of which is based upon the experience obtained at Trollhattan, will be placed in operation next year. Also at Arendal, two electric furnaces are being built by another company for the production of pig iron. In the production of steel by the electric process, the intention is to use steel scrap largely. The process consists of melting the scrap in an open-hearth furnace, where it is roughly refined, then transferred to a Roechling-Rodenhauser electric furnace, where the process is completed.

Modern Steel Casting Annealing Processes*

Beneficial Effects of This Treatment and a Discussion of the Use of the Microscope and Pyrometer in This Work

By Bradley Stoughton

The annealing of steel castings is not always a necessary operation in their manufacture, and especially in the manufacture of small steel castings which have not great length to produce severe strains by shrinkage. While it cannot be denied that proper annealing must benefit all steel castings in greater or less degree, on the other hand, annealing, as too frequently practiced, is often more of a detriment to some castings in the heat than it is a benefit to the remainder. Annealing has the two-fold purpose of relieving any strains produced in the metal during cooling in the mold, and of improving the strength and ductility of the metal by breaking up the coarse structure inevitably developed to some extent during cooling from solidification and, in some cases, amounting to that extreme degree of coarse crystallization which causes the appearance known as *ingotism*. Annealing to relieve strains is a comparatively simple operation, but annealing to produce the best grain obtainable, which shall in turn give the highest possible combination of strength and ductility to the casting, is an operation so often imperfectly understood and crudely practiced in foundries, that I hope an interchange of ideas may be of benefit, even though I cannot offer anything new or revolutionary for consideration.

The microscope and some form of pyrometer, however crude, is an invaluable adjunct to annealing practice. The time has passed when steel foundries can obtain the best results in competition by means of the unaided eye. The pyrometer will tell us when the steel has reached that temperature which will give to it the best grain, and, therefore, the best physical properties, while the microscope will tell us whether or not this heat treatment has performed its work as thoroughly as it should. If the structure of the casting, after its first solidification, is not excessively coarse, heating it slightly above its critical temperature, maintaining it there until the heat has penetrated to the most remote point, and then for about one-half hour thereafter, will produce the desired result. But, if the steel has been cast at an excessively high temperature, or if it cooled with unusual slowness through the first 200 or 300 degrees after solidification, or if, in any other way, an unusual coarse and open crystalline structure has been produced, the process of annealing described above, even if protracted beyond the time limits mentioned there, will not completely obliterate the coarse crystals. The large crystals will be broken up into smaller ones, it is true; nevertheless, a sort of skeleton work, showing indistinctly the boundaries of the previous large size crystals, will persist, and the steel will be somewhat below normal in strength and ductility, or both.

*Presented at the Pittsburg convention of the American Foundrymen's Association.

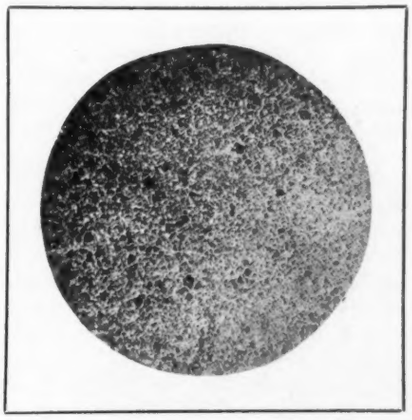


FIG. 1—MICRO-PHOTOGRAPH OF STEEL CONTAINING 0.50 PER CENT CARBON; GRAIN OF ROLLED STEEL
(Magnified 40 diameters.)

Steel Samples.

This point will be well seen by reference to Figs. 1, 2 and 3. Fig. 1 shows fine-grained steel as produced by forging or rolling; Fig. 2 shows the same steel in a very coarse, crystalline state, while Fig. 3 shows the same steel after again reheating above its critical temperature. It will be noted that the large crystals are broken into smaller ones, but there still persists a skeleton work, showing the outline of some of the coarse grains.

Figs. 4, 5 and 6, on the other hand, show steel in a finely grained condition; the same steel with a coarse structure, and finally this coarse structure refined almost to its original condition.

In order that the steel, shown in Fig. 3, might be refined as completely as that shown in Fig. 6, two steps in the annealing would be necessary. The coarse-grained steel would first have to be heated for an hour or more after com-

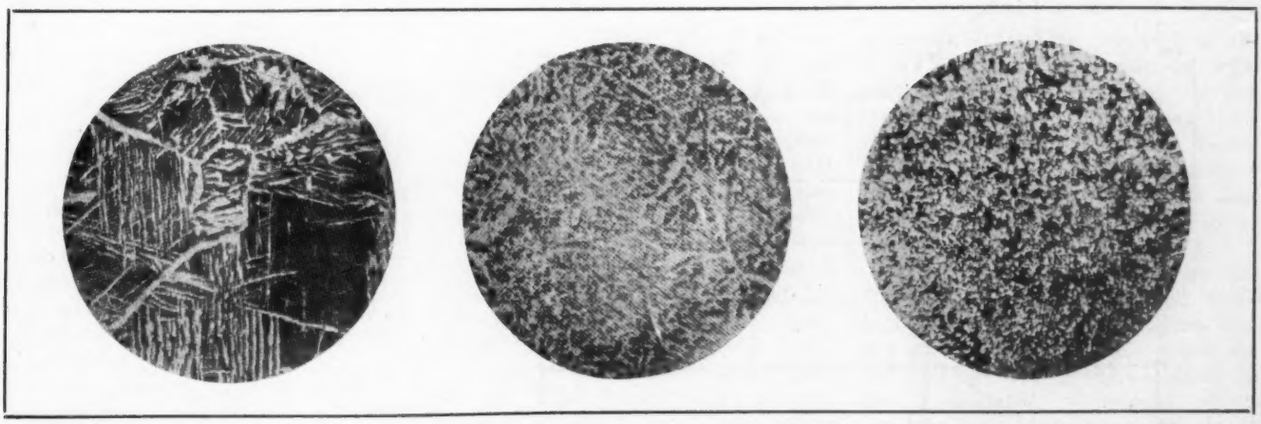


FIG. 2—SAME STEEL AS FIG. 1; COARSE GRAIN DUE TO HEATING TO HIGH TEMPERATURES
(Magnified 40 diameters.)

FIG. 3—SAME STEEL AS FIG. 2; REHEATED TO REFINE THE GRAIN
(Magnified 40 diameters.)

FIG. 4—STEEL, 0.05 PER CENT CARBON; GRAIN OF ROLLED STEEL
(Magnified 40 diameters.)

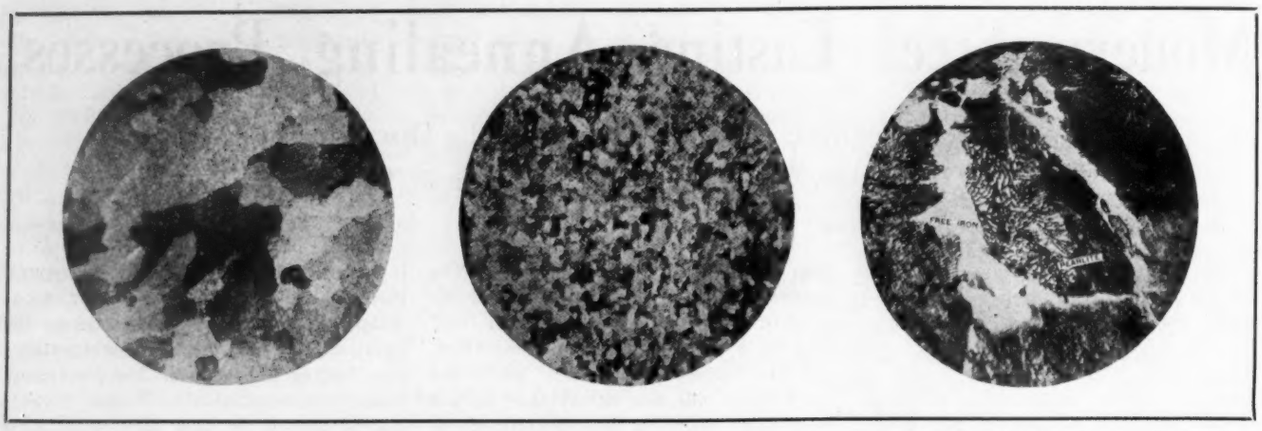


FIG. 5—STEEL, 0.05 PER CENT CARBON, HEATED TO HIGH TEMPERATURES
(Magnified 40 diameters.)

FIG. 6—SAME STEEL AS FIG. 5; REHEATED TO REFINE GRAIN
(Magnified 40 diameters.)

FIG. 7—STEEL COOLED SLOWLY FROM 650 TO 1,200 DEGREES FAHR.
(Magnified 250 diameters.)

plete soaking at a temperature far above its critical temperature. This would produce a structure intermediate between that of Fig. 1 and Fig. 2, and would obliterate the skeleton work showing the outlines of the previous coarse crystals. Such a casting must then be cooled to a black heat and subsequently reheated slightly above its critical temperature in order to give it the best possible physical qualities. This double process, of course, involves a waste of time, heat and labor and the bad quality of the coarse structured steel may not always be bad enough to justify this expenditure; but it should be remembered that this double process—and this alone—can redeem steel castings of extraordinarily coarse crystalline structure.

Another point about the annealing of steel castings which is not often emphasized is that slow cooling through that limited interval of temperature known as the *critical range* is detrimental to both strength and ductility. Slow cooling below 1,200 degrees Fahr. will improve the ductility of the metal, but slow cooling from 1,700 down to 1,200 degrees Fahr. develops thicker grains of ferrite and cementite and reduces both strength and ductility. Fig. 7 shows the structure of steel which has been cooled very slowly through this interval, and illustrates the fact to which I have alluded. Fig. 8 shows the critical range of steel and iron. Most of our steel castings contain less than 0.50 per cent carbon and, therefore, the critical temperatures above which they are to be heated are located in the line, *GO*. To cool the steel slowly from above the line, *GO*, to below the line, *PSK*, will develop thick crystals of ferrite and cementite.

Because of this circumstance, there has arisen a process of annealing which consists in maintaining the steel castings above their critical temperature about half an hour after they are completely soaked, then pulling them out so the air will blow upon them until they are black heat, after which they may or may not be returned to the furnace and allowed to cool as slowly as they will. Of course, it must be remembered that this method of annealing may set up strains in castings of very complicated shape, and the castings must also be so piled that they will not strain each other during the expansions and contractions which they undergo while cooling through the critical interval.

It may be of interest to foundrymen to know that Seger cones may be purchased from the chemical supply houses and elsewhere and serve a valuable purpose in annealing work. These Seger cones are little forms of clay, melting at a great variety of temperatures. If these cones be placed in a furnace along with the castings, their melting will show when any particular temperature is attained. It is also possible to put cones in different parts of the furnace to determine the uniformity of the heat.

An ordinary horseshoe magnet is a valuable adjunct in annealing steel castings, because castings of 0.50 per cent carbon and less, lose the power of attracting a magnet when they reach a temperature of 1,550 degrees Fahr., so that in this way we can check up the eye in estimating the temperature of the annealing furnace, and this is especially valuable, because this particular temperature, 1,550 degrees, is only a short distance below the correct one for annealing.

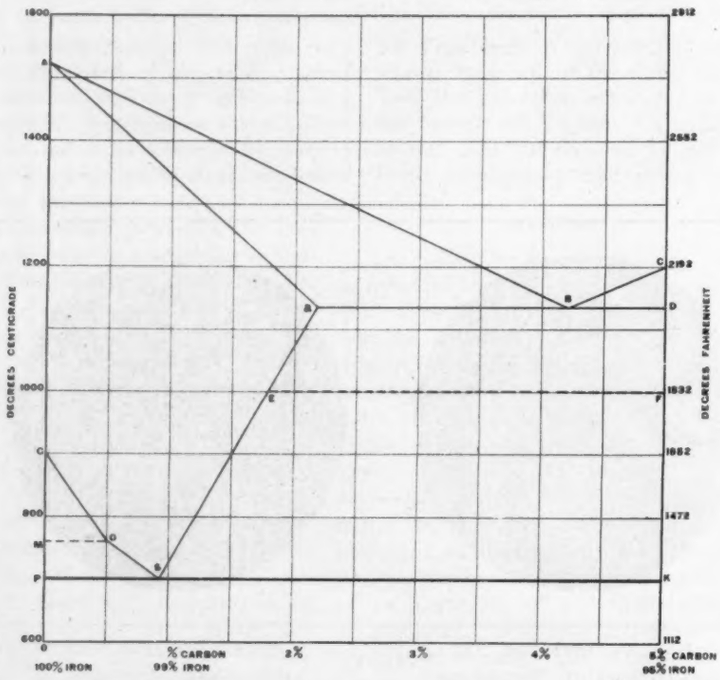


FIG. 8—DIAGRAM SHOWING THE CRITICAL RANGES OF IRON AND STEEL

Citizens of South Sharon, Pa., have voted to change the name of that town to Farrell in honor of James A. Farrell, president of the United States Steel Corporation.

Direct Current Motor for Machine Tool Drive

Description of the Construction and Application of a New Type of Direct Current Motor for Individual Drive

The growing demand for direct current electric motors that can be applied to the individual drive of machinery of various kinds has led to a number of important changes in both the mechanical and electrical design of motors used for this purpose. To meet the requirements of this service the construction should not only be compact, but also permit of mounting the motor in any position and the windings and commutator must be protected, either partially or wholly, from external injury. Geared and direct-coupled methods of driving are rapidly displacing belts and this, together with the fact that sudden and excessive overloads are of common occurrence, requires larger bearings and shafts of greater stiffness than were formerly used on motors of the same class. The demand for wide variations in speed by shunt-feed control, with occasional heavy overloads at any speed, also requires superior commutating qualities.

To meet the requirements of this service the Allis-Chalmers Co., Milwaukee, has recently designed a new line of direct current motors. They are designed for belt drive at constant speed and continuous service, or gear drive with variable or adjustable speed and intermittent service. The general features of the motor are shown in Fig. 1. The machine is very compact, the construction is rigid and the details have been worked out with special reference to the exacting requirements of machine tool drive. The field magnet yoke is a single open-hearth steel casting machined on each end to receive the housings that carry the armature bearings, which are kept in permanent alignment by the steel yoke. The bearing housings are held in place by through-bolts and on four-pole machines can be rotated 90 or 180 degrees if it is desired to mount the motor on a side wall or ceiling.

The armature laminations are perforated at intervals so as to form radial ventilating ducts. The punchings are firmly clamped between cast iron ends which also serve to support the ends of the armature coils. In addition to the radial ventilating ducts, openings are made in the armature laminations so that when they are assembled ventilating passages are formed parallel to the shaft and connecting with the radial ducts. There is thus a free passage for the circulation of air through the core and all parts of the windings.

Special attention has been given to the construction of the commutator, which is of large diameter and wearing depth. The mica between the bars is selected so as to give even wear. The clamping rings are extra large and the whole construction is designed to secure a perfect cylindrical surface free from high or low bars. The commutator sleeve is cored to permit the passage of air through to the armature.

The brush holders are of the reaction type, simple in construction and positive in action, allowing the brush to follow the surface of the commutator freely. The brush studs are fastened to a rocker arm mounted on the bearing housing; this allows the brushes to be set at the best running position, but after being once properly set they require no adjustment under any change in load within the range of the motor. The brushes are connected to the holders by flexible copper shunts so that the current is not compelled to pass through any sliding contacts.

In the use of variable speed motors for the individual drive of machine tools there are two points which should be carefully considered. The size and weight of the motor is dependent, to a large extent, on the minimum speed at which it is required to develop its full rated horsepower; the slower the minimum speed the greater will be the size and weight of the machine for a given output. The maximum speed of the motor is dependent on the peripheral speed of the armature, commutator, pinion or belt, or upon the ratio of the speed reductions between the driven shaft and the motor shaft. This limits the maximum speed from 1,000 to 1,600 revolutions per minute, depending on the output of the motor. The maximum speed being thus fixed by mechanical limitation, any increase in the range of speed variation must be obtained by decreasing the minimum speed and, therefore, increasing the size of the motor for a given output, or what amounts to the same thing, decreasing the output for a given size. These mechanical limitations make it desirable to keep the speed range down to a reasonable amount and it has, therefore, been limited in motors of this type to a ratio of 3 to 1.

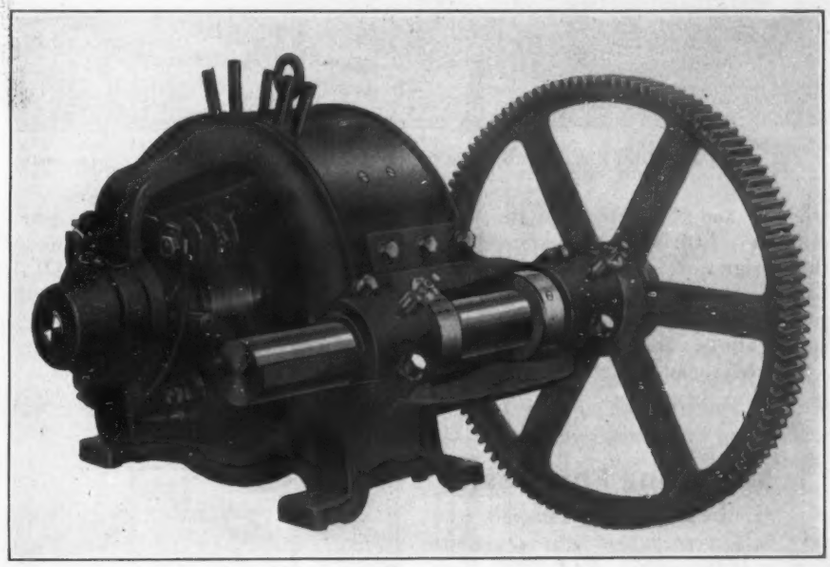


FIG. 1—ALLIS-CHALMERS DIRECT CURRENT MOTOR FITTED WITH BACK GEAR DRIVE

These constant speed motors are designed to carry their rated loads continuously with a temperature rise not exceeding 40 degrees Cent. on the windings and 45 degrees Cent. on the commutator. Overloads of 25 per cent are permissible for a period of two hours following a run at normal load without the temperature rise exceeding 50 degrees Cent. on the

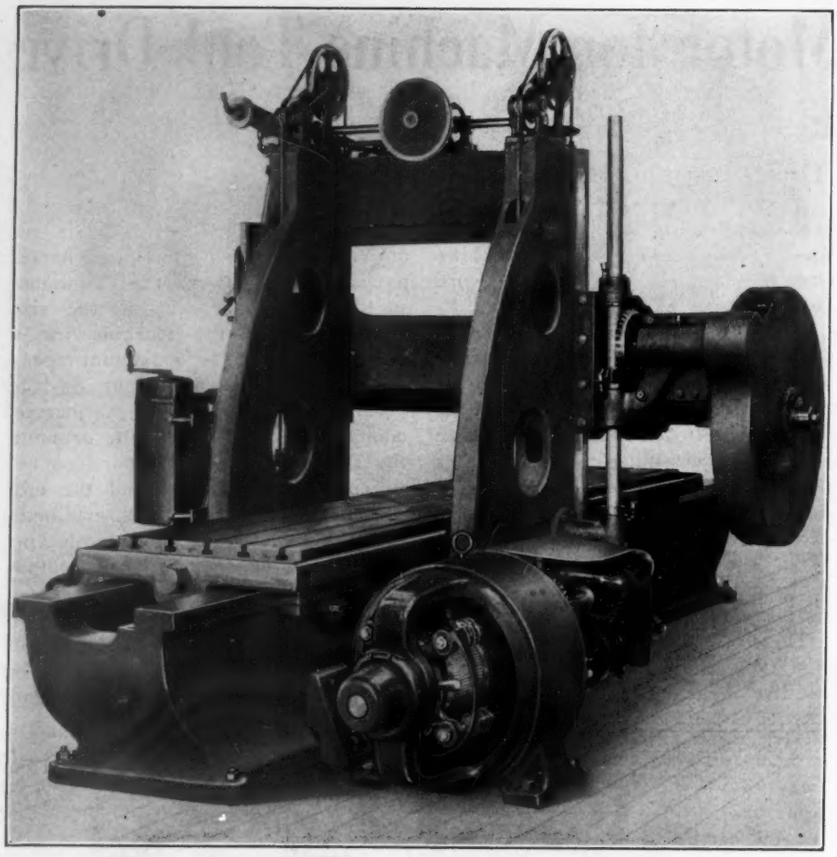


FIG. 2—ALLIS-CHALMERS MOTOR GEARED TO INGERSOLL SLAB MILLING MACHINE

winding and 55 degrees on the commutator. Provision is also made in the design for much greater momentary overloads. Adjustable speed motors are designed to fulfill the same specifications. These motors, of course, when compound wound operate equally well as generators.

Measuring Flue Gas Temperatures

The Green Fuel Economizer Co., Matteawan, N. Y., has devised a method of quickly determining the temperature of flue gases from boiler and other furnaces by means of a pendant made of fusible alloys of a proper composition to indicate the desired temperatures. The pendants are made with a large body, having a certain definite weight and are suspended from a narrow neck. The composition of the metal and cross-section of this neck are adjusted until the body of the pendant will pull the neck in two and fall at some desired temperature. In use, the pendants are hung upon small hooks from the end of a long wire which is introduced into the flue so that the pendant will be at the desired point. Pendants have been perfected for three temperatures, namely, 425, 500 and 550 degrees Fahr., which represent, respectively, the temperatures at which the use of the economizer is justified with coal at commercial prices. It is recommended that when taking the temperature of flue gases that the lowest temperature pendant be used first and to proceed until the one is found which will not melt after five or ten minutes exposure. The temperature will then lie somewhere between the temperature marked on the last pendant and the next to the last pendant used. In doing this, it is essential that several different points in the flue be tried, as it frequently happens that one part of the flue is occupied by gases much hotter than the gases in other parts of the flue.

For use in connection with these pendants, the Green Fuel Economizer Co. has calculated three tables, the first of which shows the percentage of heat escaping in chimney gases at various flue temperatures, assuming 26 pounds of air per pound of coal and 14,500 B. T. U. per pound of coal; the second table shows the minimum temperature to which it is economical to cool the gases by means of boiler surface only, and the third table gives the minimum temperature to which it is economical to cool the gases by means of an economizer.

The Milwaukee Correspondence Schools, Goldsmith building, Milwaukee, announces an increase in the tuition from $25 to $50 for its course, effective Nov. 1. The McLain system involves the mixing of iron by analysis and the methods outlined enable foundrymen to overcome their melting difficulties.

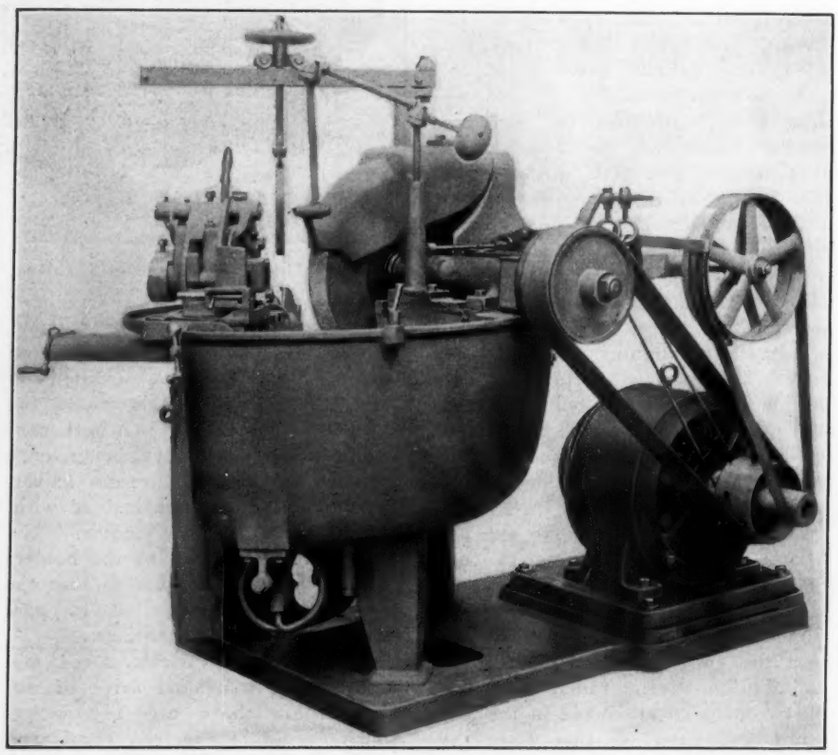


FIG. 3—DIRECT CURRENT MOTOR BELTED TO AN AUTOMATIC TOOL GRINDER

New Ransom Grinder

The accompanying illustrations show an interesting portable emery grinder, which has recently been placed on the market by the Ransom Mfg. Co., Oshkosh, Wis. In Fig. 1, the grinder is illustrated at work on a cast steel spool, and Fig. 2 shows it being used to smooth off the inside of a large cast steel slag ladle. This illustration shows how the grinder adapts itself to difficult positions. It consists simply of a pair of wide tired steel wheels, about three feet in diameter, with a stiff tube or distance piece mounted on the axle, as shown in Fig. 1. This tube is about eight feet long. The emery wheel is mounted on one end and the driving motor is carried at the opposite end, the two being connected by a belt. A five-horsepower motor is used, which may be wound for either alternating or direct current, as desired. A starting rheostat and disconnecting switch for the motor are mounted on the machine. The motor is provided with flexible connecting wires which can be attached to the mains at any convenient point. Any diameter grinding wheel between 18 and 24 inches may be used. The wheel head is connected to a sleeve which fits over the end of the distance piece and the wheel may be rotated to any desired position in grinding irregular surfaces. At the plant of the Prime Steel Co., Milwaukee, this grinder has been used for sharpening shear knives without removing them from the shear and without disturbing their adjustment.

A considerable increase in the total production of Indian manganese ore resulted from the advance in price in 1910. The increase amounted to 20 per cent in output and to over 40 per cent in value, the total exports for the year having aggregated over 650,000 tons.

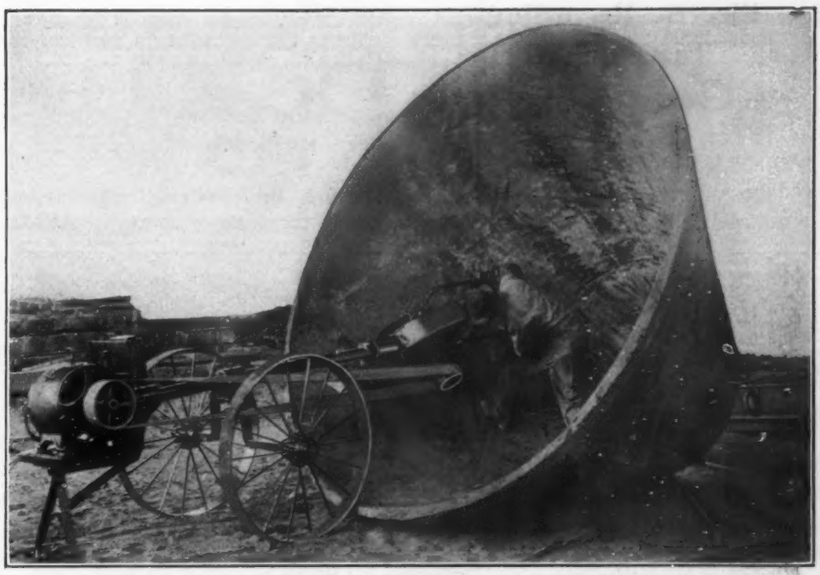


FIG. 2—PORTABLE GRINDER AT WORK ON A LARGE SLAG LADLE

Tantalum for Bearings

Referring to improvements in materials used in automobile construction, L. A. Legros, president of the Institution of Automobile Engineers of Great Britain, when addressing that body recently, stated that not only have steels and aluminum alloys been improved in their ultimate tensile strength, and in those other physical qualities essential for their safe use, but increased knowledge has been obtained as to the proper manner in which they should be treated to obtain the best commercial results.

Certain possibilities, he claimed, in regard to steel have yet to be considered. One is the application of tantalum, a metal that possesses hardness and power to resist abrasion to such an extent that attempts to drill a tantalum sheet with a diamond drill operating at 5,000 revolutions per minute for 72 hours resulted in a penetration of the metal to the extent of only one-fourth of one millimeter. This power to resist abrasion, he argued, would be very valuable in reducing the size of bearing surfaces if it could be applied to steel by surface-hardening with tantalum, so that the steel would be superficially coated with this metal.

England's Aluminum Industry

The production of aluminum in England has so rapidly increased that manufacturers can no longer sell at a profit, and as the attempts to form an aluminum syndicate have been abandoned, it is not probable that the situation will improve for a considerable time. The price to foreign consumers at the beginning of the year was about $343 a ton, while during the past month it has been considerably under $294 a ton. Prices on the London metal exchange have been as low as $260 and even $250 has been done. Aluminum at these quotations is cheaper than copper. The cost of producing aluminum varies, of course, with each maker, but it is stated that it cannot be sold at a price below $270 a ton in Great Britain, without actual loss to the manufacturer.

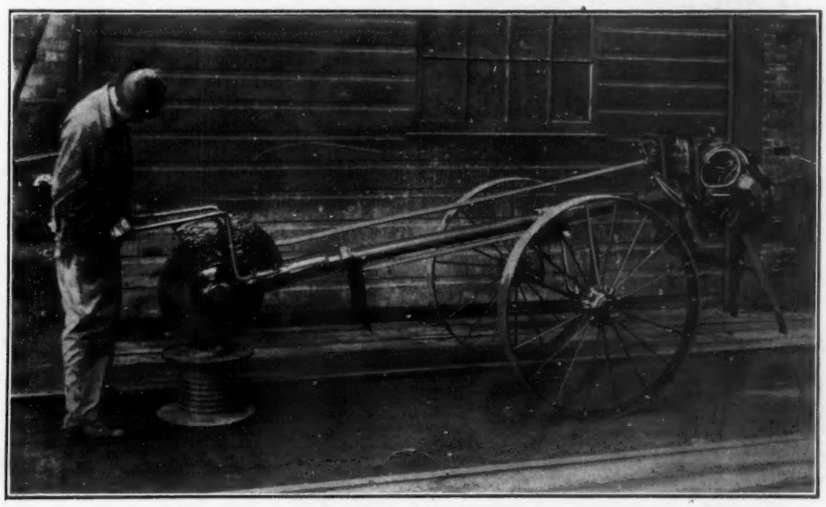


FIG. 1—PORTABLE GRINDER DRIVEN BY A FIVE-HORSEPOWER MOTOR

David McLain, Goldsmith building, Milwaukee, in a folder recently issued, calls attention to his system of teaching foundrymen how to manufacture semi-steel castings. Other courses in foundry practice are also taught which are intended to effect great economies in foundry melting methods.

Electric Recording Instrument

A new type of electric recording instrument, adaptable for use as a recording and electric pyrometer, recording voltmeter or ammeter, has been designed by the Brown Instrument Co., Philadelphia. This recording instrument is exceedingly novel in construction, as the essential parts are mounted on the door instead of in the case. The clock mechanism and chart only remain in the case when the door is opened, as illustrated in Fig. 1, which shows the instrument opened for the installation of a new chart. In Fig. 2 the pyrometer is shown with the door closed.

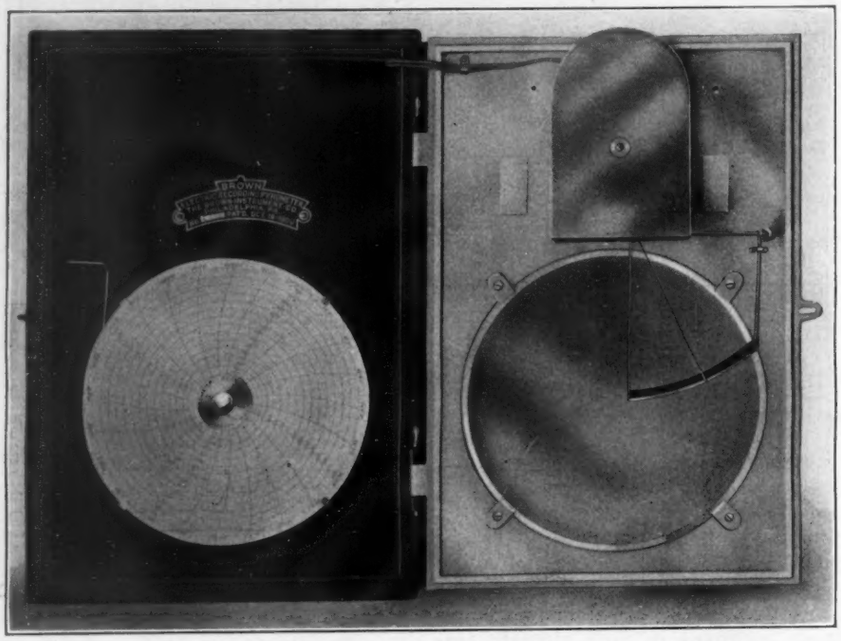


FIG. 1—BROWN ELECTRIC RECORDING INSTRUMENT WITH DOOR OPEN

The millivoltmeter system used in this new recording instrument is a simplified form of the D'Arsonval method. The recording pen comes in contact with the paper momentarily only for the purpose of making a dot, thereby eliminating all friction between the pen and the chart. An inking pad is placed at the side of the pen which carries sufficient ink for a week's supply. This pad touches the pen point frequently, keeping the point damp. When the door is closed the arm shown at the left, Fig. 2, operated by the clock mechanism, contacts automatically with the inking device and every half minute or quarter minute if preferred, it pushes the inking pad away from the pen, permitting it to swing freely. It then falls, allowing the inking pad by its own weight to press the recording pen against the paper. This instrument can be mounted on the wall or switchboard and can be used by inexperienced workmen.

Owing to the excellent harvests during the last two years in Russia and the resulting railway extensions, the large iron and steel works of this country have so many orders on hand that a large part of the work cannot be executed before 1912. An increase in ship building is also reported which, with further railway extensions, is expected to result in continued activity in the iron and steel trade next year.

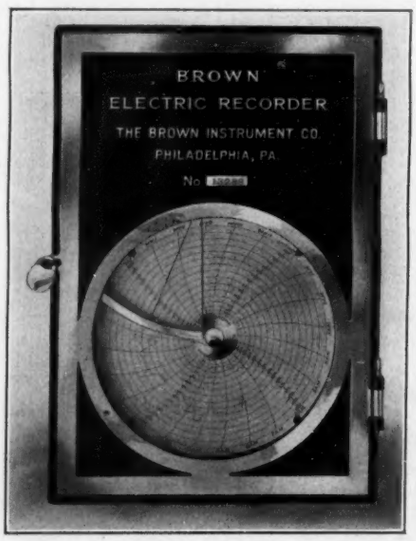


FIG. 2—BROWN RECORDER IN OPERATING POSITION WITH DOOR CLOSED

New Catalogs

HEAT TREATED AXLES.—In a 38-page catalog, issued by the Carnegie Steel Co., Pittsburgh, forged and heat treated axles, shafts and similar parts made by this concern are described and results of experimental tests to determine the effect of heat treatment of different compositions and sizes of axles, shafts, etc., are included. Tables and charts are also given which show the average results of the experimental tests. The booklet concludes with the Carnegie Steel Co.'s standard specifications for heat treated steel axles, shafts and similar parts adopted Oct. 1, 1911.

VANADIUM STEEL.—A 16-page booklet, issued by the Vulcan Crucible Steel Co., Aliquippa, Pa., is devoted to a description of the physical properties of Hecla vanadium steel which can be used for all purposes requiring great strength and endurance and is especially suitable for automobile parts, case hardened gears, etc. The chrome vanadium steel manufactured by this company and containing 0.25 to 0.30 per cent carbon, and heated from 1,550 to 1,600 degrees Fahr. and then quenched in oil after which it was tempered at 1,100 degrees Fahr., showed a tensile strength of 130,000 pounds per square inch, elastic limit of 100,000 pounds, 28 per cent elongation and a 68 per cent reduction in area. Steel containing 0.45 to 0.50 carbon heated from 1,550 to 1,600 degrees Fahr. cooled in oil and tempered at 750 degrees Fahr. showed 250,000 pounds tensile strength per square inch and 240,800 pounds elastic limit. Considerable information is contained in this pamphlet on the forging and heat treatment of steel for various purposes. This company also manufactures high speed steel which contains a high percentage of vanadium. A special vanadium steel recommended for taps, milling cutters, reamers, drills, forming tools, etc., is also made.

PIPE, CASING AND TUBULAR GOODS.—A handsomely printed, leather bound catalog, containing 176, 5 x 7-inch pages, has been issued by the Mark Mfg. Co., Chicago. This company manufactures black and galvanized wrought pipe, line and drive pipe, well casing, boiler tubes, electric wire conduits, wrought nipples, drive well points and well strainers; pump, artesian and tubular, well cylinder; tubular well valves as well as such tools as pipe cutters, vises, threading dies, die stocks, etc. This company operates mills at Chicago and Zanesville, O., and is well equipped to meet the requirements of the pipe and tubing trade. The section of the catalog devoted to oil country goods is unusually well illustrated, the various tools and supplies being printed in two colors which clearly illustrates the different metals entering into the construction of tubular well cylinders, center drive well points, irrigation strainers, well point extensions, single-screen drive well points, etc. An extensive line of well valves is also shown in two colors. Some of the other equipment noted in this catalog includes pipe and rod couplings, drive shoes, drive caps, windmill stuffing box heads, etc. The equipment cataloged includes pipe cutters, pipe vises, pipe stock and dies, melting ladles, pipe benders, clamps, wrenches, connecting links, etc. This company is also a large manufacturer of steel boiler tubes. A price list of all the products is included and the catalog should prove a valuable handbook to all users of pipe and tubular goods.

The chief event of the past week was the filing of the suit by the government, after the market closed Thursday, praying for the dissolution of the United States Steel Corporation. This action marked the end of an uneventful period, of several weeks' duration, on the New York stock exchange, and brought on a general decline throughout the entire list.

Monday, the market was dull and narrow; cotton was weak and lower; foreign markets irregular. Tuesday, trading was extremely dull with fractional price changes. Wednesday, the market was slightly more active, and price changes, with the exception of a sharp break in Republic Iron & Steel issues, were narrow. Thursday's feature was the selling pressure against iron and steel stocks and the comparative steadiness of railroad stocks; all foreign markets were firmer. Trading, on Friday, was active; the list opened with small losses on most of the prominent iron and steel issues and prices continued to decline heavily during the day, rallying somewhat at the close; Steel common touched its lowest since April, 1909; wheat declined violently. Saturday, trading was dull, prices reacting and closing higher; cotton closed lower.

Call money's range during the week was 2½ and 2 per cent. The demand for time money was the smallest in years. The actual condition of clearing house institutions showed loans increased $6,962,000; net deposits increased $16,587,000; total reserve, $424,829,000; excess of reserve, $19,653,900, an increase of $350,550. Non-member banks and trust companies showed loans increased $2,210,700; net deposits increased $1,074,700; reserve on deposit decreased $38,200; and the percentage of reserve 18.9 against 19 the week previous. Bank clearings showed a decrease of 12 per cent from last week and 5.7 per cent from last year. Commercial failures numbered 268, against 256 the preceding week and 257 the corresponding week last year. Shares were sold to the number of 2,859,600, compared with 2,817,600 the preceding week and 3,379,000 the corresponding week last year. Bonds, exclusive of government bonds, were sold to the amount of $15,559,000, compared with $14,383,000 the preceding week and $17,808,000 the corresponding week last year.

	Closing Quo. Oct. 28	Changes in week	Annual Meeting date 1911		Stock Outstanding	Basis.	Dividend Last Dividend	Dividend Date Last Div. Pay
Allis-Chalmers	3	— ⅛			$19,820,000			
Allis-Chalmers, pr	10	—1¼	Nov.	2	16,150,000	7 cum.	1¾ Q.	Feb., 1904
American Can	10	— ¼	Feb.	1	41,233,300		1¼ Q.	
American Can, pr	84½	—2			41,233,300	7 cum.	1¼ Q.	Oct., 1911
Am. Car & Fdy	47	—1½	June	29	30,000,000		½ Q.	Oct., 1911
Am. Car & Fdy., pr	114	—1			30,000,000	n. c.	1¾ Q.	Oct., 1911
American Loc	32½	—2	Oct.	17	25,000,000	5	1¼ Q.	Aug., 1908
Am. Loc., pr	103	.....			25,000,000	7 cum.	1¾ Q.	Oct., 1911
American Ship	49⅞	.....	Oct.	11	7,600,000	4	2 Q.**	June, 1911
American Ship, pr	106½	.....			7,900,000	7 cum.	1¾ Q.	Oct., 1911
Am. Steel Foundries	28	—2	Dec.	7	17,184,000		1 Q.	May, 1911
Barney & Smith	15	.....	June	6	2,000,000	4	1 Q.	Dec., 1907
Barney & Smith, pr	70	.....			2,500,000	8 cum.	2 Q.	Sept., 1911
Bethlehem Steel	28¾	+ ¾	April	4	14,862,000		.....	.....
Bethlehem Steel, pr	56	+ ½			14,908,000	7 n. c.	¾ Q.	Feb., 1907
Cambria Steel	43½	— ⅝	Mar.	21	45,000,000	5	1¼ Q.	Nov., 1911
Cambria Iron	44	.....			8,468,000*	4	2 S. A.	Oct., 1911
Chicago Pneumatic Tool	44½	—1½	Feb.	20	6,485,800	4	1 Q.	Oct., 1911
Colorado Fuel	25½	—2	Oct.	16	34,235,500		1¾ Q.	Apr., 1902
Crucible Steel	10	— ¼	Oct.	18	24,578,400		3½ Q.	.....
Crucible Steel, pr	74	—2			24,463,500	7 cum.	1¾ Q.	Sept., 1911
Empire Steel	5	.....	Feb.	22	1,254,770		.....	.....
Empire Steel, pr	50	.....			2,500,000	6 cum.	1 S. A.	July, 1911
Fay & Egan	70	.....	Feb.	21	1,000,000	6 cum.	3 S. A.	Feb., 1911
Fay & Egan, pr	110	.....			1,000,000	7 cum.	1¾ Q.	Aug., 1911
General Electric	147¼	—2⅞	May	9	65,179,600	8	2 Q.	Oct., 1911
Harbison-Walker	45	—3	Jan.	16	18,000,000		½ Q.	Sept., 1911
Harbison-Walker, pr	97	—2			9,600,000	6 cum.	1½ Q.	Oct., 1911
International Pump	26	—1¼	Dec.	12	17,762,500		1 Q.	Nov., 1910
International Pump, pr	81½	.....			11,350,000	6 cum.	1½ Q.	Nov., 1911
Lackawanna Steel	30	.....	Mar.	4	34,978,000		.....	.....
Lake Sup. Corp	27½	+ ⅝	Oct.	4	40,000,000		.....	.....
New York Air Brake	46½	—7	Mar.	8	10,000,000	6	1½ Q.	July, 1911
Niles-Bement-Pond	94	.....	Feb.	8	8,500,000	6	1½ Q.	Sept., 1911
Niles-Bement-Pond, pr	104	.....			2,000,000	6 cum.	1½ Q.	Aug., 1911
Otis Elevator Co	68	.....	Mar.	20	6,375,000	1	1 Q.	Oct., 1911
Otis Elevator Co., pr	95	.....			6,310,000	6 n. c.	1½ Q.	Oct., 1911
Pa. Steel	60	.....	May	8	10,750,000		.....	.....
Pa. Steel, pr	103	.....			16,500,000	7 n. c.	3½ S. A.	Nov., 1911
Pittsburgh Coal	18	— ⅜	Feb.	10	28,104,600		.....	.....
Pittsburgh Coal, pr	78½	—1½			27,071,800	7 cum.	1¼ Q.	Oct., 1911
Pressed Steel Car	28⅜	— ⅛	Feb.	15	12,500,000		1 Q.	Aug., 1904
Pressed Steel Car, pr	95⅛	+ ⅛			12,500,000	7 n. c.	1¾ Q.	Nov., 1911
Pullman	159	— ¾	Nov.	8	120,000,000	8	2 Q.	Nov., 1911
Railway Stl. Spring	26	—1	Mar.	2	13,500,000	2	1 S. A.	Oct., 1908
Railway Stl. Spring, pr	97¼	+3¼			13,500,000	7 cum.	1¾ Q.	June, 1911
Rep. Iron & Steel	19	—3¼	Oct.	18	27,191,000		.....	.....
Rep. Iron & Steel, pr	76¼	—8¼			25,000,000	7 cum.	1¾ Q.	Oct., 1911
Sloss-Sheffield	38	—2	Mar.	15	10,000,000	5	1¼ Q.	Sept., 1910
Sloss-Sheffield, pr	112	.....			6,700,000	7 n. c.	1¾ Q.	Oct., 1911
U. S. Pipe & Fdy. Co	13¾	.....	June	28	12,106,300		1 Q.	Dec., 1910
U. S. Pipe & Fdy. Co., pr	42	—1			12,106,300	2	1¼ Q.	June, 1911
U. S. Steel	52¾	—7	April	17	508,302,500	5	1¼ Q.	Sept., 1911
U. S. Steel, pr	104⅜	—5¼			360,281,100	7 cum.	1¾ Q.	Aug., 1911
U. S. Steel 5s	100¾	—1⅜			463,798,000	5	.....	.....
Va. Iron, Coal & Coke	60	.....	Sept.	19	9,073,680		5. †	Oct., 1907
Westinghouse Electric	63¼	—1⅝	July	26	3,998,700*		1¼ Q.	Oct., 1911
Westinghouse Air Brake	145	.....	Oct.	3	13,750,000*		5 Q. ‡	Oct., 1911

Par value of shares, $100, except those starred (*), $50.
**Includes last 1 per cent payment of 4 per cent extra.
†Stock.
‡Includes 2½ regular, 1½ extra and 1 special.

Copper Stocks.

New York.—Amalgamated copper closed 52¼, a net loss of 1⅛.

Boston.—Butte Coalition closed 16, no change; Calumet & Arizona closed 48, a net loss of 1½; Calumet & Hecla closed 375, a net loss of 14½; North Butte Mining closed 24, a net loss of 1½; Quincy Mining closed 59, no change.

Financial Notes.

The Grant-Lees Machine Co., Cleveland, has increased its capital stock from $200,000 to $400,000.

The Wheeling Mold & Foundry Co., Wheeling, W. Va., has increased its capital stock from $250,000 to $750,000.

The International Harvester Co. has declared the regular quarterly dividend of 1¾ per cent on preferred stock, payable Dec. 1.

The Champion Iron Co., Kenton, O., has secured a contract to furnish the steel for the construction of the Parochial school, at Delphos, O., which will require about 300 tons.

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THE AVERAGE PAID CIRCULATION OF THE IRON TRADE REVIEW FOR THE ISSUES OF THE FOLLOWING MONTHS WAS:

January, 1911	6,058
February	6,072
March	6,091
April	6,108
May	6,112
June	6,124
July	6,138
August	6,152
September	6,161

November 2, 1911

Uncle Sam's Buying

THE DAILY IRON TRADE REVIEW is making a special and important feature of publishing details of government awards and proposals of iron and steel and non-ferrous products, machine tools and machinery. It is the only daily paper in the country which publishes the news, which is of vast importance to a large number of business men. As many awards are usually made on Tuesday, the news concerning them is published in the daily of Wednesday.

Another very strong feature of the daily is the non-ferrous market department. In addition to the daily telegraphic news, there are also extended reviews of the American and foreign metal markets published from time to time. The information on which these reviews are based is collected by experts.

Utter Folly of Attempting to Help the Administration

The suit asking for the dissolution of the Steel Corporation is filed at a time when the welfare of the people, especially those commonly known as the workingmen, demands that no unnecessarily harsh methods be adopted in endeavoring to regulate business. The action is untimely, unreasonable and shows that the present administration prefers to fight the great industries of the country and tear them to pieces rather than to attempt to bring about better conditions through friendly co-operation of government officials and those entrusted with the management of those great industries.

The suit is untimely on account of business conditions, which have been depressed since the fall of 1907, and because the government is now having its first real experience in readjusting consolidations which have been declared unlawful. The last reason is the more important one, for while the government is trying to show that the recent decisions in the Standard Oil and Tobacco cases can be worked out along practical lines, making two good trusts out of companies generally conceded to have been very bad trusts, it would seem to have about all it can accomplish in the way of handling large corporations. The problem is one of the most difficult ever undertaken by statesmen. Even a Wickersham or a Dickinson might be able to learn something from the experience to be acquired in reorganizing the Standard Oil and Tobacco companies and in supervising their operations. Within a few months, it will probably be known whether operations under the "dissolved" companies will be essentially different from those of past years. It may be that we shall find out that a practicable plan of operation cannot be devised under the recent decisions of the supreme court and that a radically different plan, involving the repeal of the Sherman law and the enactment of a more satisfactory bill for the regulation of corporations, will become necessary. At any rate, the administration might well have awaited the developments of the next few months.

The suit is unreasonable because the five allegations into which the charges may be divided are not founded on such facts as to justify the granting of the prayer of the petition. Usually in asking for the dissolution of an alleged trust, the crushing of competition is alleged. In this case, the reverse is made the cause of complaint, namely, that the Corporation was too friendly with its competitors and even went to the extreme of eating a number of dinners with them. As to the Great Northern ore lease, Mr. Dickinson admits that he knew that notice of the cancellation would soon be given, but he asserts that one of the main reasons for bringing the suit was to stop the digging of ore as soon as the government shall win the suit. Now we cordially hope that the hearing of the suit will be expedited, but if the final decree shall be entered before Jan. 1, 1915, the time of the expiration by notice of the ore lease, that will be a new record for a case of such tremendous importance in the highest tribunal of the land. Hence, for Mr. Dickinson to give this excuse and to show such remarkable anxiety concerning an inconsequential amount of ore which the Corporation might possibly be prevented from mining, is ludicrous. The allegations concerning the deception of President Roosevelt and the charges about the defunct pools are almost as flimsy.

The facts as to untimeliness and unreasonableness of the suit are not,

perhaps, as interesting or important to the employer and employe in general as is the revealing of the attitude of the administration toward the industries of the country. In the prosecution of an offender on a charge of murder or other crime concerning which there is no ground for difference as to the immorality of the act, the prosecutor does not often obtain much help from the defendant, who stands squarely on his legal rights. If, however, in an exceptional case, a prisoner does help the prosecutor, there is at least an implied promise or obligation of leniency on the part of the prosecutor. In the cases of the so-called anti-trust prosecutions, the government began wandering some 20 years ago in an unexplored forest. Pathways have been slowly made and now there seems a little better prospect of reaching the promised land of thoroughly and fairly regulated business. But ever since the passage of the Sherman bill men have differed as to what it prohibited and as to what it made a crime. Some corporations, at an early date, were openly antagonistic to regulation by the government and obstructed investigation by resorting to all conceivable kinds of expedients to evade the law and prevent any enforcement that would interfere with their business. On the other hand, some corporations long ago offered to do all in their power to help the government. This was pre-eminently true of the United States Steel Corporation under the wise guidance of Judge Gary and his associates. The Roosevelt administration started an investigation of the Corporation under the direction of Commissioner Garfield, who pushed it earnestly, but with a spirit of apparent fairness. The co-operation of the Corporation was complete and continuous. It not only made an immense amount of information available, but even went to the expense of compiling it. This expense was very heavy. Then came investigations, such as those of the house and senate while the Payne tariff bill was pending, and the present house investigation. To every committee summons, officers of the Corporation responded promptly, with patience, with frankness, and with an astonishing amount of information. Judge Gary's examination by the Stanley committee alone occupied a number of days and fills several volumes of the printed testimony. Costs and other facts are given with remarkable fullness.

But we cannot even outline what the Corporation has done to assist in solving the mighty problem of regulating great combinations of capital. It has not only made public its affairs to an unprecedented extreme but has been indefatigable in endeavoring to ascertain the law and steadfast in obeying it. How has it been treated in return? Decently by the Roosevelt administration and also by that of Taft until the filing of the dissolution suit. Even the full report of Commissioner Herbert Knox Smith, issued a few days ago, furnished no reason for abandoning the hope, long entertained, that in at least the case of one great industry, reasonable regulation, fair competition and justice to all would be accomplished without resort to a fight of any kind, in or out of court. But now that hope is shattered. The same base ingratitude exhibited by federal authorities at Cleveland toward a great independent firm, that of M. A. Hanna & Co., when it tried to assist the government, is now displayed by government officials in the case of the Steel Corporation. We trust that business men everywhere will take the bringing of this latest suit as a notice that it will be well for them to stand on their legal rights. NO COMPANY IN THE HISTORY OF THE WORLD HAS SPENT AS MUCH TIME, ENERGY AND MONEY AS HAS THE STEEL CORPORATION IN FURNISHING INFORMATION TO BE TWISTED OR OTHERWISE USED AGAINST ITSELF. Other companies will learn from its experience.

We are confident that in the end the Corporation will win a splendid vindication and we are hopeful that some day this nation will have an administration with which it will be possible for the industries of the country to co-operate in solving the great problems which concern all the people.

NEW DIRECTORS

Of American Iron and Steel Institute Elected.—Number Increased to

At a special meeting of the members of the American Iron and Steel Institute, which was held at New York, Oct. 26, it was voted to increase the number of directors from 15 to 21, and a proper amendment to this effect was added to the constitution. The election of the additional directors resulted as follows: J. G. Butler Jr., of the Brier Hill Iron & Coal Co., Youngstown, O.; Chas. S. Price, president of the Cambria Steel Co., Johnstown, Pa.; Robert Hobson, general manager of the Steel Co. of Canada, Hamilton, Ont.; Frank S. Witherbee, Witherbee, Sherman & Co., Inc., New York City; F. W. Roebling, secretary and treasurer of the John A. Roebling's Sons Co., Trenton, N. J., and Isaac M. Scott, president of La Belle Iron Works, Steubenville, O. Percival Roberts, of Philadelphia, a director of the United States Steel Corporation, was elected a member of the institute.

Van Alstyne Resigns

David Van Alstyne, vice president of the Allis Chalmers Co., Milwaukee, who has been in charge of the manufacturing operations of the company, has announced his resignation, effective Nov. 15, and will engage in private practice in engineering in New York City. Mr. Van Alstyne is a well known engineer, and is a member of the American Society of Mechanical Engineers. He was formerly vice president of the American Locomotive Co.

C. E. Search, formerly assistant to Mr. Van Alstyne, has been appointed manager of the Reliance and West Allis works of the company, the appointment to be effective Nov. 15.

Ore Miners Drowned.—Twelve miners employed by the Wharton Steel Co. in one of its iron ore mines near Hibernia, N. J., were caught by a rush of water breaking out of an old workings on Oct. 19, and were drowned. One of the victims was an American, the others being Slavs. This is the worst disaster from flooding of a shaft in Morris county since the mines began operating in revolutionary days.

Fire damaged the plant of the Joplin Separator Co., at Galena, Ill., to an extent of $15,000 on Oct. 23.

Equity Suit Aims to Dissolve Steel Corporation

United States Department of Justice Files Petition Against Great Concern—Voluminous Document—Many Charges

Dissolution of the United States Steel Corporation is sought by the United States government in a bill in equity filed at Trenton, N. J., on Oct. 26, in the United States circuit court. The bill alleges that the Steel Corporation is an illegal combination in restraint of trade forbidden by the Sherman anti-trust law of July 2, 1890. Named in the bill as defendants are 37 companies, mostly subsidiaries of the Steel Corporation, five persons as trustees, and 18 others as officers and directors of the Steel Corporation or its subsidiaries.

The government asks that, pending final hearing and disposition of the case, a temporary restraining order be issued to enjoin the defendants from continuing the alleged illegal monopoly. It was not asked that the injunction be issued at once. Formal appearance will be entered by representatives of the Steel Corporation at Trenton, on Dec. 4, and the formal answer of the Corporation will be filed on or before Jan. 2, 1912, providing no legal delays be interjected. Both government representatives as well as Steel Corporation officers are quoted as declaring that they desire that the legal battle be proceeded with as rapidly as consistent with the care demanded by the magnitude of the issues involved.

The bill was prepared in Washington and carries the signatures of Attorney General George W. Wickersham and former Secretary of War Jacob M. Dickinson, the latter being appointed special assistant to the attorney general two months ago to prosecute the case. The name of United States District Attorney J. B. Vreeland, of Trenton, appears as that of the prosecuting attorney.

The announcement of the filing of the document at Trenton was the first intimation given the public that such a step was actually contemplated at this time by the department of justice. The secret of the bill's preparation was well kept, the formal announcement being made at Washington after the document had actually been filed after the close of the stock market on Thursday. The bill itself consists of 93 printed pages and it sets forth in much detail specific instances of the Steel Corporation's organization and subsequent acts. In the general argument presented it follows closely the topical arrangement and treatment pursued by Herbert Knox Smith, commissioner of corporations, in his recently published "Report of the Commissioner of Corporations on the Steel Industry. Part I", dated July 1, 1911. In fact, throughout the more difficultly phrased and semi-technical portions, the equity bill follows the commissioner's wording in many places verbatim.

After naming the various defendants, the bill proceeds to a brief presentation of affairs and conditions prevailing in the iron and steel trade of the United States prior to the consolidations in 1898-1900, as follows:

Previous to and until the year 1898, the bulk of the iron and steel business of the United States among the several states and between the several states and foreign countries was carried on by many different persons, partnerships or corporations which were in active and general competition with each other, except at various times and in various localities, where such trade was restrained by them by unlawful pools and combinations.

In 1898, there began a rapid and radical revolution in the steel and iron business, characterized by great consolidations, resulting in bringing by the year 1900 a very large proportion of important branches of those industries, such as crude and semi-finished steel, rail, structural steel, plates, merchant bars, wire rods and wire products, sheets, tin plate and tubes, under the control of consolidated concerns, each comprising many who formerly had been competitors.

These consolidations are then discussed in detail, beginning with the Federal Steel Co., which is described as a great security holding company. It names the concerns that were merged in the Federal company and says that by the merger the company came into control of 15 per cent of the ingot capacity of the country. The profits of the underwriting syndicates in these transactions are pointed out, in the case of the Federal company, for instance, the underwriters getting $5,680,000 preferred stock and $8,400,000 common stock in return for $4,800,000 cash and services in organizing the company. The document then says:

The purpose and effect of such consolidation were a combination between said consolidated companies and the Federal Steel Co., their officers, agents, promoters and underwriters, in restraint of trade and commerce among the several states and with foreign nations, within the meaning of section 1, and were an attempt by the said parties to monopolize and a monopolization of part of the trade or commerce among the several states and with foreign nations, within the meaning of section 2 of the Anti-Trust act.

This paragraph is substantially repeated after every subsidiary in turn has been described as was the Federal concern above instanced. Further the discussion of each consolidation concludes with:

The United States Steel Corporation acquired, as hereinafter set out, the control or ownership of all the aforesaid companies and properties.

Discussing the conditions leading to the formation of the Steel Corporation, it is declared:

While through the formation of the companies aforesaid competition was largely eliminated in their respective lines, there was in 1900 and up to the time when effective steps were taken to absorb all of these concerns by the United States Steel Corporation active competition between the Carnegie company, the Federal Steel Co. and the National Steel Co., the three principal producers of crude steel. These three companies were also in competition with some of the other consolidated companies in the sale of the lighter finished products. The success achieved and the power gained by the consolidations stimulated these companies and those controlling them severally to larger enterprise and more ambitious plans involving further elimination of competition and restraint of trade and commerce. A general consolidation was brought about through the United States Steel Corporation, thereby still further preventing competition, which was imminent.

The Carnegie company and the Federal Steel Co. manufactured steel rails, some other heavy finished products and semi-finished steel products. For the sale of their semi-finished products they were dependent upon other manufacturers, among whom were some of the consolidated companies.

The National Steel Co. was in the same condition, except that as to marketing its products it could count the American Sheet Steel Co., the American Steel Hoop Co. and the American Tin Plate Co. as customers on account of their being closely affiliated through a common control.

The American Steel & Wire Co., which in its beginning enjoyed a practical monopoly in wire products and subsequently had acquired iron and coal properties and a vessel fleet, was mainly dependent on other producers for the steel billets used in making its product. The National Tube Co., which at its formation controlled the greater part of the production of wrought pipe and tubes in the United States, purchased a very large part of its crude steel.

The American Sheet Steel Co., the American Tin Plate Co. and the American Steel Hoop Co. were only partially

protected as to obtaining their raw material through a common control. There was a general movement upon the part of these concerns to control their raw material and all stages of the manufacture of their products.

Consolidation Movement.

For example, the American Steel & Wire Co., whose constituent concerns had largely patronized the Federal Steel Co. and the Carnegie company, planned in 1900 to make its own iron and steel. The National Tube Co., a large customer of the Carnegie company, proposed to erect additional blast furnaces and steel works. The American Tin Plate Co., the American Sheet Steel Co. and the American Hoop Co., then large customers of the Carnegie company, and other makers of steel were rapidly making themselves independent through the increase of the crude steel capacity of the National Steel Co., which secured extensive ore and coal properties and a fleet of lake ore vessels.

Thus competition, under old methods of doing business having been restricted and in some products almost entirely destroyed, threatened to make a new way and re-establish itself in a vigorous fight. The leaders to the steel industry feared the breaking down of the restraints upon trade and the overthrow of the partial or complete monopolies which they had established. The Carnegie company and the Federal Steel Co. saw the danger of their former customers becoming their rivals. Both of these companies took step looking to the manufacture of finished products, such as structural material, tubes and universal plates.

About the close of the year 1900 the Carnegie interests announced that they would erect an immense tube plant at Conneaut, on Lake Erie. A period of greater competition had already been foreshadowed. This announcement brought affairs to a crisis. A "battle of the giants" was discussed in the daily papers and in the trade journals.

If each of these actual and progressive competitors had worked out its own destiny in trade, commerce and production, unobstructed by combinations or agreements entered into for the purpose of restraining competition and trade and commerce among the states, and between the states and foreign countries, new plants would have been established, and such trade and commerce would have developed under different conditions, and free from restraints which, as will be shown, were imposed with the purpose and effect of unduly restraining such trade and commerce and monopolizing in part such trade and commerce.

An opportunity was offered, through further consolidation and restriction of trade and commerce, for enormous profits, as a reward for effecting the combination and as a result of the flotation of inflated stocks. On account of its announced purpose, which contributed largely toward precipitating the crisis and also on account of its great strength, it was manifest that in order to form an effective combination it was necessary to control the Carnegie company. Considering the magnitude of the entire undertaking it was carried to a conclusion with unprecedented swiftness.

Within four months from the announcement by the Carnegie company of its purpose to extend its activities into new fields, a new corporation was created for the purpose of preventing further competition, and eliminating the existing competition between said companies.

THE DEFENDANTS.

Companies Named.

The United States Steel Corporation, the Carnegie Steel Co., the Carnegie Co. of New Jersey, the Federal Steel Co., the National Steel Co., the American Steel & Wire Co. of New Jersey, the National Tube Co., the Shelby Tube Co., the American Tin Plate Co., the American Sheet & Tin Plate Co., the American Sheet Steel Co., the American Steel Hoop Co., the American Bridge Co., the Lake Superior Consolidated Iron Mines, the Union Steel Co., the Clairton Steel Co., the H. C. Frick Coke Co., the Tennessee Coal, Iron & Railroad Co., the Great Western Mining Co., the West Missabe Land Co., Ltd., the Wright Land Co., Ltd., the Davis Land Co., Ltd., the Wells Land Co., Ltd., the Stone Land Co., Ltd., the Wabigon Iron Co., the Minosin Iron Co., the Nibiwa Iron Co., the Wenona Iron Co., the Minawa Iron Co., the Leonard Iron & Mining Co., the Argur Iron Mining Co., the Phillmore Iron Mining Co., the Harrison Iron Mining Co., the Jackson Iron Mining Co., the Polk Iron Mining Co., the Tyler Iron Mining Co., the Vanbeuren Iron Mining Co.

Individuals Named.

J. Pierpont Morgan, Charles Steele, George W. Perkins, E. H. Gary, Charles M. Schwab, Andrew Carnegie, Henry C. Frick, James Galey, William H. Moore, J. H. Moore, Edmund C. Converse, Percival Roberts Jr., Daniel G. Reid, Norman B. Ream, John D. Rockefeller, John D. Rockefeller Jr., P. A. B. Widener and William P. Palmer.

Ore Trustees Named.

Louis W. Hill, James N. Hill, Walter J. Hill, Edward T. Nichols, J. H. Gruber.

Was Over-Capitalized.

In detail the formation of the Steel Corporation, together with a discussion of the various persons concerned therein, is taken up. The capitalization of the Corporation and the method of payment for the merged concerns are explained and the bill says further:

The capitalization was many millions of dollars, not less than $800,000,000 in excess of the value of the properties thus taken over. It was vastly in excess of the amount upon which those properties under normal conditions could earn a fair return. The earnings of the Corporation were not commensurate with its actual capital, nor were they entirely the legitimate fruits of the earning capacity of those properties separately controlled, however well administered, but were, to a very large extent, approximately one-half, the result brought about by the power exerted over trade and commerce by such a vast combination of capital, the restraint imposed upon trade and commerce, the suppression of competition, the influence upon the control of prices, and the many direct and indirect advantages derived from the co-operation of so many men of influence in trade and commerce, who, formerly acting in rivalry, were by the combination drawn together in a common interest. Consumers and the public at large were through the power created and exerted by such a vast combination compelled to pay an unlawful tribute of many millions of dollars annually to the Corporation.

Much stock was issued on an inflated basis in exchange for stock acquired in absorbed companies, which stock itself had been issued upon a partly inflated basis, and of the balance many millions of dollars were a reward for mere promotion and underwriting. In the direct exchange of securities the Corporation issued $1,191,882,532 of stock and bonds in exchange for a total of $881,224,405 stocks of the constituent companies and Carnegie company bonds.

The carrying through of consolidation was entirely under the supervision of J. P. Morgan & Co. as syndicate managers. The syndicate turned over to the Corporation $25,000,000 in cash, which constituted all that was added of intrinsic value to the properties combined except for $3,000 cash paid in by the incorporators and sundry stocks of a par value of $174,000. For this consideration and its expenses, services and risk the syndicate received $64,998,768, par value, of preferred, and $64,998,837 of common stock of the Corporation. This enormous takeout was possible because the syndicate managers and those most influential in effecting the combination were prominently identified with the management of several of the constituent companies and afterward with the control of the Corporation itself.

The underwriting syndicate included several who variously were officers or directors of the companies which were combined. The total amount of the new capitalization, representing payments in stocks to syndicates as promoters for organizing the new Corporation and the previous combinations which it took over, exceeded $15,000,000 after allowing for new capital contributed and reasonable expenses. The new inflated capitalization of the Corporation exceeded the old inflated capitalization of the constituent concerns, plus the new cash capital provided and sundry stocks, as above mentioned, by $415,481,732, or by over 45 per cent.

The main prospect for maintaining

earnings on the many millions given for promotion and issued in excess of valuation was the power in the business achieved by combination, the potency of a vast aggregation of capital, the affiliations brought about with powerful banking and transportation companies and the direct and indirect control of trade that thereby ensued. This was a fictitious basis resting on unlawful combination. The value of stock thus issued largely depended upon earnings largely based upon subjecting the public to conditions which could only continue by an abuse of the public.

Two long paragraphs are devoted to discussion of the amounts paid for the Carnegie company, saying:

The $160,000,000 in bonds of the Carnegie company except $550,000 were exchanged for a like amount of the bonds of the Corporation. The stock holdings in this company of Andrew Carnegie, Mrs. Lucy C. Carnegie and George Lauder, amounting to $96,000,000 par value, were exchanged for $144,000,000 par value in first mortgage bonds of the Steel Corporation. The remainder of the Carnegie stock, $64,000,000 par value, was exchanged for $98,277,120 par in preferred stock and $90,279,040 par in the common stock of the Corporation. Thus was given for $160,000,000 par value of stock and $159,450,000 bonds of the Carnegie company $303,450,000 of bonds and $188,556,160 of stock of the Corporation, making a capitalization of $492,006,160 in exchange for one of $319,450,000.

The value of the tangible property of the Carnegie company did not exceed $160,000,000. The books of the Carnegie Steel Co., Ltd., showed that the net value on Dec. 31, 1899, of the assets was $75,610,104. This, to a large extent, represented the actual cost of the property, as shown in the balance sheets of the company, and the same was a full, fair and accurate valuation. This statement from the books was verified under oath by Andrew Carnegie and other members of the company. Before the Steel Corporation was formed, and within three years prior thereto, H. C. Frick obtained an option on the Carnegie property at the price of $160,000,000. He proposed the purchase to J. P. Morgan, who declined it upon the ground that the price was too high. And yet, when the plan was made to bring all of these properties under one great combination and get rid of Mr. Carnegie as a competitor, Mr. Morgan and associates paid not less than $492,006,160 for substantially the same property which he but a short time before did not consider worth $160,000,000.

Government's Prayer for Relief

In consideration whereof, and inasmuch as adequate remedy in the premises can only be obtained in a court of equity, the United States of America prays your honors:

First—To order, adjudge, and decree that the combinations and conspiracies and monopolizations of trade and commerce hereinbefore described are unlawful, and that all acts done or to be done to carry out the same, or any part thereof, are in violation of the act of congress of July 2, 1890, entitled "An Act to Protect Trade and Commerce Against Unlawful Restraints and Monopolies."

Second—That the defendants, and each and every one of them, and the officers, directors, stockholders, and agents of the defendant corporations, and of each and every one of them, be perpetually enjoined from doing any act in pursuance of or for the purpose of carrying out the same.

Third.—That the United States Steel Corporation, in and of itself, as well as each and all of the elements composing it, whether separate or individual, whether considered collectively or separately, be decreed to be illegal and in restraint of trade, and an attempt to monopolize and a monopolization within the first and second sections of said act of congress of July 2, 1890, and that it be dissolved.

Fourth—That each and all of the said constituent or subordinate companies shown, as aforesaid, to have been combined in restraint of trade and commerce and in monopolization of trade or commerce within the meaning of the Anti-Trust act, each in and of itself, as well as each and all the elements composing each, respectively, whether considered collectively or separately, be declared to be illegal, in restraint of trade, and an attempt to monopolize and a monopolization within the first and second sections of said act, and that each be dissolved.

Fifth—That the holding of stock by any one of the defendant corporations in another of the defendant corporations under the circumstances shown be declared illegal, and that each of them be enjoined from continuing to hold or own such shares and from exercising any right in connection therewith.

Sixth—That the said several defendant corporations shown as aforesaid to be constituents or subsidiaries of the United States Steel Corporation be enjoined and prohibited from declaring or paying any dividends to the said United States Steel Corporation or to any person or corporation for its use.

Seventh—That it be decreed that the several individual defendants combined each with other persons and corporations to restrain trade and commerce and to attempt to monopolize and in monopolizing within the first and second sections of said act, and that each of them be enjoined from continuing to carry out the purpose of any of the above-described combinations and conspiracies and attempts to restrain commerce and trade, or to monopolize any part of commerce and trade among the states and with foreign nations.

Eighth—That such orders and decrees be made in respect of the stock issued under the several combinations aforesaid as shall be in accordance with equity and good conscience, and that such disposition be made of the said various properties as shall effectuate the purposes of the said Anti-Trust act.

Ninth—That the said lease entered into as aforesaid by the Great Northern interests and the Great Western Mining Co. be decreed to be illegal, in restraint of trade and commerce, an attempt to monopolize and a monopolization within the first and second sections of said act, and that the same be now canceled.

Tenth—The United States also prays for such other and further relief as the nature of the case may require and the court may deem proper in the premises.

Extent of Properties.

The capacity and extent of the properties brought together in the final consolidation are then set forth. The document says that at its organization the Steel Corporation acquired works with an annual capacity of more than 9,400,000 tons of steel ingots and more than 7,700,000 tons of finished rolled iron and steel products. It gives a table showing the proportions of output of principal iron and steel products produced by the Corporation and by other companies in the United States in 1901. This table shows that in only one case—that of pig iron—did the Corporation produce less than half the total production of the country, and in other products its proportion ran as high as 82.8 per cent. The Corporation also acquired railroads with more than 1,000 miles of main track, a fleet of 112 lake ore vessels, iron ore reserves in the lake region estimated by the Corporation at over 500,000,000 tons, more than 50,000 acres of coking coal lands with a great acreage of other grades of coal, and besides numerous miscellaneous properties.

After citing the fact that in 1902 President C. M. Schwab valued the Corporation's ore holdings at $700,000,000, the bill declares that this was a large over-estimate of the actual value of the iron ore under free commercial conditions and could only be sustained as an artificial valuation produced by the power for monopoly of the large holdings under control.

The acquisition of various concerns subsequent to the Steel Corporation's formation was taken up in detail, including the American Bridge Co., the Lake Superior Consolidated Iron Mines with its ownership of the Duluth, Missabe & Northern railroad, the Bessemer Steamship Co., the Shelby Steel Tube Co., interests in the Oliver Iron Mining Co. and the Pittsburgh Steamship Co., the Union Steel Co., the Troy Steel Products Co. and the Clairton Steel Co. Referring to the Lake Superior Consolidated company's acquisition, the bill says:

It was a very important acquisition to the Corporation. The control of this road with that of the Duluth & Iron Range railroad (acquired in the original

consolidation) gave the Corporation a very effective control of ore transportation in the Minnesota ore regions, not only with respect to its own production, but also to that of many of its competitors.

The Ore Leases.

Several paragraphs are devoted to consideration of the Great Northern ore lease, which the Steel Corporation announced last Thursday it proposed to cancel. After calling attention to the fact that the lease cannot be cancelled until Jan. 1, 1915, after giving two years' notice, the bill says:

By this transaction the Corporation desired to prevent this ore either from being mined and sold to independent competitors, or from being utilized to build up a new and dangerous competitor in the iron and steel business. The practical effect was to forestall competition and to greatly increase the Corporation's control of the ore resources of the country. The royalty agreed to be paid was unprecedentedly large, thus showing the extent to which the Corporation was willing to go to prevent this ore falling into the hands of competitors. By this acquisition the Corporation strengthened its dominating position. * * *

Petitioner has been informed by the Corporation that its finance committee, on Oct. 17, 1911, unanimously decided to cancel said lease. However, under the terms of said lease no such cancellation can take effect before Jan. 1, 1915, and there is no limitation upon the amount of ore than can in the meantime be taken out by the Corporation.

In each of these instances of acquisition, the bill declares that it was done in contravention of the Anti-Trust act.

Roosevelt Excused.

The manner and methods by which the large properties of the Tennessee Coal, Iron & Railroad Co. came into the possession of the Steel Corporation in 1907 was discussed into many ramifications, most of which has been published in THE IRON TRADE REVIEW in the past six months. Referring to the visit paid President Roosevelt at Washington by Judge Gary and H. C. Frick while the negotiations were going forward for the turning over of the Tennessee company to the Steel Corporation as a step toward the prevention of further spread of the panic then in full swing, the bill says:

The president was not made fully acquainted with the state of affairs in New York relevant to the transactions as they existed. If he had been fully advised, he would have known that a desire to stop the panic was not the sole moving cause, but that there was also a desire and purpose to acquire the control of a company that had recently assumed a position of potential competition of great significance. The president, taken as he was partially into confidence and moved by his appreciation of the gravity of the situation and the necessity for applying what was represented to him to be the only known remedy, stated that he did not feel it to be his duty to prevent the transaction. The matter then moved rapidly to consummation.

The Corporation and its powerful banker allies did not advance the money or lend the bonds of the Corporation upon the Tennessee stock, which would have relieved Moore & Schley so far as the Tennessee collateral was concerned and which would not have exceeded $6,000,000 or $8,000,000. They took the position that nothing would relieve the situation but the Steel Corporation taking over absolutely the majority of the Tennessee stock. This was done and the Corporation acquired also under the same agreement additional stock, bringing the entire amount up to $30,374,825, leaving outstanding only $220,160. The Corporation exchanged for the stock its own bonds on a basis which paid par in cash for stock which Gary a few days before said was not worth more than 60 cents on the dollar.

While as to much of the situation the facts are in doubt, it is certain that the Steel Corporation availed itself of the embarrassment of Moore & Schley at a most critical period, and the hammering of the Tennessee stock and the threatening of a general financial calamity, to acquire the control of a competitor, taking on a formidable aspect. By this purchase the Steel Corporation acquired 447,423 acres of mineral lands in Tennessee, Georgia and Alabama, containing approximately 400,000 tons of merchantable ore and 1,200,000,000 tons of coal, of which over one-third is coking coal. The possibilities of the Tennessee properties and the development of its raw material are immense and greatly increased the control by the Corporation over the total available ore supply of the country.

The Corporation thus greatly strengthened its control of the iron ore supply of the country, its predominating position in the iron and steel trade of the south, eliminated a competitor and unlawfully acquired a power which is a menace to the welfare of the country and should be destroyed.

Commanding Position.

Then follows a discussion of the position achieved by the Corporation through control of coal, coke, iron ore and transportation. The control of transportation of ore by railroads and ships which it owns gives the Corporation a commanding position over its competitors, none of whom has any considerable transportation and some of whom are dependent entirely for such service upon the Corporation. Reference is made to the profits reported by the Corporation's two Lake Superior railroads, the Duluth & Iron Range paying dividends averaging 100 per cent per annum, while the Duluth, Missabe & Northern ranged from 102 to 140 per cent per annum. Reference is also made to the recently announced intention of the Corporation to reduce the carrying charge for ore on these railroads 20 cents a ton. The bill says that the minor roads of the Corporation give it undoubted and important advantages over its competitors. Further, by the acquisition of the Tennessee company large quantities of raw material are locked up by the Corporation, preventing its acquisition by possible competitors. Along this line it says:

The control of such a large proportion of available ore and of so much of the transportation of the ore from the ore fields gave the Corporation the power to largely control the iron and steel market and force its plans and

Chairman E. H. Gary's Statement

I think it would be improper for me at this time to make any comments concerning the suit which has been brought against the United States Steel Corporation, except to say I regret exceedingly that the department of justice felt called upon to institute proceedings. If any harm results, it will fall upon the stockholders, aggregating a very large number, and any loss to them must be deplored. It is a time for everyone to keep cool, with a disposition to patiently await results, knowing that in the end justice will be done to all interests.

I believe a disclosure of all the facts applicable to the allegations contained in the government's bill of complaint as a ground for relief will show that the suit ought to be decided in favor of the Corporation on the merits; and that the following facts will be established:

First.—That in the organization of the United States Steel Corporation those in charge had no intention of forming a monopoly or of restraining trade.

Second.—That the Corporation never has had, or attempted to exercise, a monopoly or to restrain trade.

Third.—That the conduct of the affairs of the Corporation has clearly and positively negatived any effort or intention to violate any provision of the Sherman Law.

Fourth.—That the existence of the Corporation has been of benefit and not of injury to its employes, its customers, its competitors and the general public.

Fifth.—That no misrepresentation was made to the president relative to the Tennessee Coal, Iron & Railroad properties, and that the motive of those connected with the purchase was to prevent a threatened general financial disaster which would have adversely affected the Corporation as well as others.

wishes on its competitors, restrain competition, control market prices, restrain trade and commerce between the states and with foreign countries, and this it has since 1901 continuously done in contravention of the Anti-Trust act.

The next section of the document deals with extensions made by the Corporation since its organization out of its earnings, these investments amounting to between $400,000,000 and $450,000,000, thereby increasing its power, influence and dominancy.

A long and detailed discussion follows on the changes that have occurred in the properties of various constituent concerns. Appended to the bill is a table showing the amounts of outstanding capitalization of the various subsidiaries and the amount of such capitalization owned by the Corporation. Another table of similar tenor gives the financial position of each constituent company, all showing the dominance of the Corporation throughout.

In technical language, the next section points out the charge of the government as to the various subsidiaries, concluding thus:

All the business of the Corporation and its controlled companies is conducted without competition among them, and as a part of a general plan and combination by which they have partly destroyed competition in trade and commerce among the states and with foreign nations, and have by their strength, acquired a great influence over competitors, whereby they are brought into harmonious action with the Corporation in restricting competition and in restraining such trade and commerce.

Pools Discussed.

Various pool agreements are then discussed in detail, these being made by constituent companies, it is charged. Among them are the plate association, structural pool, steel rail combination, wire rope combination, rubber-covered wire association, horseshoe manufacturers' association, underground power cable combination, weatherproof and magnet wire combination, lead and cased rubber wire association, bare copper wire combination and other pools and agreements. By these means, the bill charges prices have been agreed upon and maintained and commerce has been restrained.

A system of "interlocking directorates" is then described, of which this is said:

In addition to pools a more euphonious, refined, but none the less effective method came into vogue. Conditions had so changed as to make the way for this new procedure easy. When the iron and steel products were made by independent concerns, which in their desire for business broke out from time to time in sharp competition, the only method of restraint was an agreement or pool, and this was not always effective, for they frequently played false to such combinations.

Under the policy of the Steel Corporation there grew up a community of interest and a power to influence action to a common purpose never exceeded in the commercial history of the world. There came into existence a system of interlacing of directorates which embraced almost the entire commercial and financial powers of the country. It has been a constantly growing system since the creation of the Corporation and therefore the personnel and alliances vary for the several years since 1901, but the system and the power achieved by it have been practically the same down to the present time.

In a schedule annexed to the petition are shown the various corporations in which the officers and directors of the Steel Corporation are also directors. G. F. Baker is shown to be a director in 56 other companies, among them being trust companies, seven banks, 18 railroad companies, the Pullman company and the International Harvester Co. Edmund C. Converse is a director in 28 other companies, including many which are large consumers of iron and steel. William E. Corey was a director in 32 other companies and John F. Dryden in three large trust companies and two banks. J. P. Morgan was a director in 51 other companies, including the Pullman company and the Western Union Telegraph Co. Other directors are shown to have had connections with many corporations interested in the steel and iron business or powerful in the world of finance.

"The possibilities of power and control that may thus be exerted over trade and commerce is inestimable," according to the government's petition. "The power and control that have been exerted by the Corporation, largely through the grasp of its tentacles thus thrown out upon the consumer, competitors and capital, is incompatible with the healthy commercial life of the nation."

The Gary Dinners.

The so-called "Gary dinners" are dealt with in the last section of the bill, although not specifically by this name, and in this language:

Under the auspices of the Steel Corporation these interests, naturally competitive but harmonized by this network of corporations and overshadowed and dominated by the power of the Corporation arising from its pre-eminence in the business and the irresistible strength of its alliances, come together from time to time, find out the views of the Corporation in respect of prices and output and all that hitherto was affected by pools and formal agreements, reach a common understanding and purpose and proceed to carry them out.

It is not here alleged that merely assembling and mutually exchanging information and declaration of purpose amounts to an agreement or combination in restraint of trade. These meetings and their results have gone further. What they actually accomplished shows the great and dangerous power achieved by the corporations through unlawful combination exercised over the trade and commerce of the country. The concerted action taken has prevented fluctuation in prices and competition.

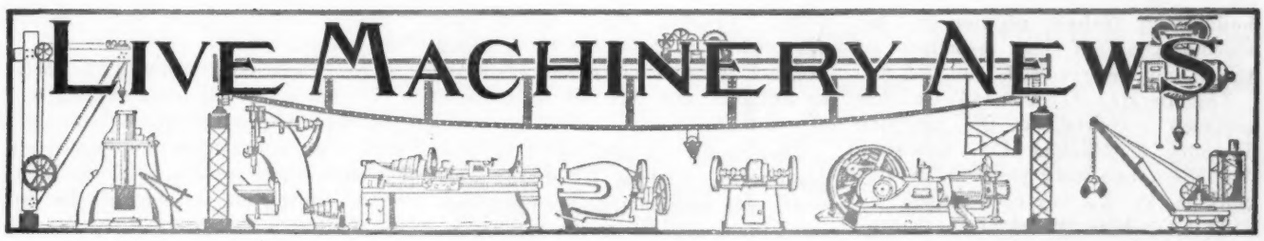
At the meetings have been represented, of the iron and steel trade in the United States, fully 90 per cent of the total. In no line of business in the world at any time has there been such a large percentage of those engaged in a business as the percentage of those in this country who at these meetings go along day by day, hand in hand, pursuing the same course. At the time of one of these meetings held in New York, Jan. 11, 1911, there was not in this country a demand for more than 50 per cent of the total producing capacity in the lines of those there represented, and there was not enough business to go around, and there was no possible way of protecting themselves from competition, except by coming to an understanding that each would be satisfied with a proportion of the business which was understood by all, and this understanding was carried out and no one of them competed for the recognized business of the other.

These meetings accomplished more than did the old pools and agreements which were frequently broken. It was understood and agreed that they were bound to protect one another, that to carry out this purpose their honor was at stake, and that the obligation binding on them was even dearer than life itself, and that no one of them should act or fail to act, except with a distinct and clear understanding that his honor was involved, and that this was more binding on him than any written or verbal contract.

When bidden by the chief executive of the Corporation, they came at any time, from any distance, ready, willing and anxious to turn over to him and his friends all that was in their minds and in their hearts concerning their own business. * * * *

At these meetings, they not only exchanged information, but advocated control of prices and reached a common understanding, which was followed, under solemn admonition that they were bound by an obligation more estimable than life. These meetings brought about the maintenance of prices. When an understanding was reached, individual declarations were made of intentions to follow the movement. It was recognized that they followed the policy laid out for them by the head of the Corporation.

All the things narrated, the bill charges, constituted a violation of sections 1 and 2 of the anti-trust act. Then follows the general prayer for relief referred to in another page.



Power Plant Equipment

The Fort Pitt Coal Co. is increasing the capacity of its power plant near Connellsville, Pa.

The North Fork mine, Forest, Cal., is making surveys and estimates for the installation of an electric power plant.

The Des Moines Central Heating & Power Co., Des Moines, Ia., W. H. Schott, president, has decided to rebuild its plant.

J. H. McGuire and others, of Morris, Minn., are preparing plans for the construction of a lighting plant to cost $15,000.

Wallingford, Conn., will ask for new bids during the next six weeks for a 500-kilowatt turbine and other electrical equipment, to cost $30,000. A. L. Pierce is the engineer.

Power and conveying equipment will be purchased by the Harlan-Lowe Milling Co., Bardwell, Ky., which has announced plans for the erection of an elevator.

A number of municipal improvements, to reach a total cost of $250,000, are planned for Kalamazoo, Mich. They include a new city hall, a street lighting system, etc.

The Washington Fruit Lands & Irrigation Co., Othello, Wash., is planning to install electric pumping machinery in the new Priest Rapids section.

Electric equipment will be installed in the elevator of the Fayetteville, Tenn., Grain Co., which was recently put in operation with J. W. Hardin, as manager.

J. L. Borland, representing eastern capitalists, has purchased the plant of the Greenville Electric Light, Heat & Power Co., Greenville, Pa., which will be rebuilt.

The city officials of Danville, Va., are having plans prepared for a municipal electric light plant to cost about $150,000. A recent vote on the question authorized an issue of bonds for the purpose.

The American Power & Light Co. has acquired the Hanford Irrigation & Power Co., Hanford, Wash., and will enlarge the plant on Priest Rapids and make other improvements. G. W. Talbot is president.

The New York City department of health, Fifty-fifth street and Sixth avenue, will receive bids until Nov. 9, for erecting an extension to the boiler house of the Riverside hospital on North Brother Island, New York.

The Anderson-Tully Co., Memphis, Tenn., will be in the market for power equipment, for the operation of a large addition to its box factory. C. H. Allen is in charge of the purchase of the required equipment.

Oscar Claussen, St. Paul, and Charles Pillsbury, Minneapolis, have prepared plans and specifications for a municipal lighting plant to be installed at Duluth, at an estimated cost of $901,798.

The Central Indiana Water, Light, Heat & Power Co., Francisville, Ind., E. A. Rossiter, president, will soon ask for bids for the construction of water, light, heat and power plants in a number of neighboring towns.

The Chesapeake & Ohio railway will erect an electric power station in Covington, Ky., for the purpose of operating the telegraph system of the road. The building alone will cost $15,000.

Earle D. Jackson, engineer, St. Paul, has recommended to the council of New Ulm, Minn., that an additional engine and dynamo be installed at the municipal plant, at a cost of $3,800. This would render the construction of a condenser and cooling tower unnecessary.

The Central New York Gas & Electric Co., Geneva, N. Y., contemplates making improvements requiring the expenditure of about $40,000. A 520-horsepower boiler will be installed, and other mechanical equipment bought. A. B. Wainwright is manager of the Geneva plant.

F. S. Shields, secretary of the sewerage and water board, New Orleans, will receive bids until Nov. 7, for the following machinery: One 6,000-kilowatt, horizontal, high pressure, condensing steam turbine and alternating current unit; one 150-kilowatt, rotary converter with stationary transformers and one seven-panel switchboard.

H. M. Byllesby & Co., Chicago, have on foot plans for the construction of a large hydro-electric plant at the Cumberland Falls, on the Tennessee river near Williamsburg, Ky. A survey which was begun some time ago is now being completed, and definite decision on the project is expected in the immediate future. The falls have a perpendicular drop of 60 feet.

New Construction

The Hupp Motor Co., Detroit, is commencing the erection of a large factory building in that city.

The Southern Railway Co. has ordered a dozen or more machine tools, to be shipped to western shops.

The Liberty Foundry Co., 7601-7609 Reilly avenue, St. Louis, will build a one-story foundry to cost $3,500.

The Cleburne Foundry & Machine Shop Co., Pecos, Tex., will erect a foundry. J. A. Hardy is manager.

The Gonzales Bridge & Iron Co., Gonzales, Tex., will soon commence work on a factory building.

Plans are now out for an addition which will double the capacity of the Columbus Wire & Iron Works, Columbus, O.

The Western Stove Works, Peoria, Ill., is reported to be contemplating the erection of a stove works at Moberly, Mo.

The Molle Typewriter Co., organized by J. E. Molle, Antigo, Wis., will probably locate its works at Wausau, Wis.

The American Rubber & Fabric Co. has secured a site of three acres at Jeannette, Pa., on which a new plant will be erected.

The Celluloid Co., 295 Ferry street, Newark, N. J., is erecting an addition to its plant at 181 Kossuth street, estimated to cost $10,000.

The Canadian Motor Co. has been granted a free site at Galt, Ont., but no announcement has yet been made as to when the company will build.

Machine tools and other equipment will be purchased by Conner & Wallafe, who are erecting a foundry and machine shop at Columbia, Miss.

The American Seeding Machine Co., Springfield, O., is making some improvements in its machine and wood-working departments.

Robert C. Gotwald, architect, Springfield, O., is receiving bids on an addition to be erected by the Foos Gas Engine Co., that city.

E. F. Krueger, Glenwood, Wis., is

building a 60-foot addition to his machine shop. A small assortment of tools will be required.

The Berkley Glass Sand Co. has awarded a contract to the Lewiston Foundry & Machine Co., Lewiston, Pa., for a two-story plant at Berkley Springs, W. Va., to cost $40,000.

The Asheboro Wheelbarrow & Mfg. Co., Asheboro, N. C., contemplates enlarging and improving its plant, in which case some fabricating machinery will be required.

The Milwaukee Concrete Mixer & Machinery Co., Milwaukee, which has been having its products manufactured under contract, will probably build its own plant this fall.

The Western Screw Products Co., 3811 Lincoln avenue, St. Louis, is reported to be in the market for automatic screw machines, oil separators and milling machines.

The Western Brass Mfg. Co., Chicago, has taken out a permit for the construction of a three-story brick shop and warehouse at 2005-2011 Marshall boulevard, Chicago.

The Canada Cement Co. is enlarging its Port Colborne, Ont., plant to twice its present capacity. The entire plant, when completed, will employ 500 men.

The Pittsburgh Armature Co., now located at River avenue, Pittsburgh, has purchased a site in the West End, Pittsburgh, on which a new factory building will be erected.

Plans have been prepared by the Asbestos Protected Metal Co., Beaver Falls, Pa., for two additional buildings, 128 x 488 feet, and 20 x 60 feet, respectively.

The Harris Municipal Incinerator Co. is reported to be planning the erection of a plant at Nashville, Tenn. Address the Industrial Bureau of that city.

The Air-Tight Steel Tank Co., Pittsburgh, has placed a contract with Thomas M. Reynolds for a one-story addition to its plant on Glouster street.

A permit has been granted to the Heppenstall Forge & Knife Co., Pittsburgh, for a one-story addition to its plant on Forty-Seventh and Hatfield streets, to cost $25,000.

The Owensboro Buggy Co., Owensboro, Ky., has let a contract for a new three-story building, and work upon the addition will be rushed to completion. Considerable equipment will be required.

Plans have been completed for an addition to the Carnegie Technical schools, Pittsburgh, the new building to be 60 x 175 feet and 80 feet high. It will be equipped with modern machinery and will cost about $100,000.

The machine shop of Hathaway Bros., Corvallis, Ore., was recently damaged by fire, the loss being $5,000. Most of the machinery was destroyed or damaged and this will be replaced at once.

The Joplin Novelty & Mfg. Co., Joplin, Mo., Charles L. Moon, president, will manufacture stamped novelties and will be in the market for presses, dies, electric motor and plating plant.

The Kelly Road Roller Co., Springfield, O., is considering the erection of a large addition. It is reported that plans will be prepared this winter and the addition erected next spring.

The Canadian Northern Railway Co. has decided to double the capacity of the Atikokan Iron Co.'s furnace plant at Port Arthur, Ont., and establish a foundry at that place to make use of the output.

The Stettler Foundry Iron Works, Stettler, Alberta, has been purchased by L. Martin, who will install new machinery. The former proprietor, H. A. Underwood, will manufacture band saws and gas engines in the future.

The Smalley Mfg. Co., Manitowoc, Wis., the oldest manufacturing concern in that city, has purchased a site, 60 x 150 feet, for future extensions of the business. It has not yet been decided if the new purchase is to be used for buildings at once.

A machine shop will soon be erected in Prosser, Wash., by James S. Watson, of Chicago. He has bought the machinery of the Pacific Power & Light Co., and will erect a building as soon as a location can be found.

The Severance Mfg. Co., Nashville, Tenn., V. J. Severance president, has under consideration the erection of a branch factory for the manufacture of gas plants for residences. The plant will be built either at Jacksonville or Pensacola, Fla.

The National Cash Register Co., Dayton, O., which is constructing a plant at Toronto, is not yet ready to announce the machinery and other requirements for the new plant. The matter will be taken up late next spring.

The American Locomotive Co., 30 Church street, New York City, is reported as the buyer of a large site on Jackson avenue, Long Island City. It is said that the company will begin plans for erecting an extensive service plant at once.

It is reported that the Thomas Mfg. Co., Springfield, O., will soon commence work on the construction of a foundry which it has had under consideration for about a year. The foundry will occupy a site opposite the present plant.

The Cleveland Welding & Mfg. Co., Cleveland, just incorporated, will manufacture products for automobiles, etc. The concern is not yet ready to announce its plans. E. I. Heinsohn, Cleveland, is one of the incorporators.

Plans have been filed with the building inspector of Harrison, N. J., for a factory addition to the present plant of the Hyatt Roller Bearing Co., Middlesex street. The building will be four stories, of iron and brick construction, and is estimated to cost $10,000.

Hyatt McCribbs, chairman of the citizens industrial committee, Verona, Pa., announces that he has sold a site of two acres for a new metal working enterprise. The name of the purchaser has not been announced, but Mr. Hyatt states that work on the proposed new building is to be started within 60 days.

Ground has been broken at Jefferson, Wis., for the new plant of the Kenzler-Waverly Motor Co. The main building will be of brick construction, 60 x 100 feet, and one story high. It will be ready Dec. 1. Forty men will be employed. The company will manufacture motorcycles and motors.

J. W. Wells, a prominent lumberman, and M. B. Lloyd, manufacturer, Menominee, Mich., will establish a plant at Menominee for the manufacture of automatic wire weaving machines. Contracts have been let for a factory building, 60 x 200 feet, two stories, and of reinforced concrete and brick construction. It will be ready Jan. 1.

Clinton & Russell, architects, New York, have filed plans with the New York building department for the construction of a seven-story factory building on Eleventh avenue, near Twenty-second street. The building will be approximately 125 x 200 feet, and fireproof, and will cost about $400,000. The Otis Elevator Co., 17 Battery place, is owner.

The Chicago Steel Foundry Co., Nineteenth and Rockwell streets, Chicago, has purchased a 226 x 298-foot site on the Chicago & Alton railroad, between Thirty-seventh street, Thirty-seventh place and Kedzie avenue. It will erect a foundry, 150 x 200 feet, and a two-story office building and pattern shop. Raeder & Wood are the architects.

The Fort Wayne Auto-Motor Co., Fort Wayne, Ind., advises that it contemplates erecting some additions to its plant, although nothing definite has yet been determined. The additional space will be used to manu-

facture motors for trucks and automobiles. New machinery will be installed, but this has not been selected or the specifications determined.

The McCowen-Probst-Menau Co., Salem, Ind., which began operations several months ago in the manufacture of plumbers' supplies and enameled specialties, is planning the addition of new equipment so as to increase the capacity of the plant. W. G. Probst, formerly connected with the Standard Sanitary Mfg. Co., is in charge of the plant.

The Copp Stove Co., Ltd., Fort William, Ont., advises that it has purchased the plant of W. J. Copp, Son & Co. for $131,000 and will manufacture stoves and ranges. The foundry has been enlarged by the addition of 20 floors and 4,000 feet of floor space has been added to the mounting and erecting department. Some new machinery will be added in a short time.

Herman Schlegel, manufacturer of furnaces, washing machines and other appliances, Appleton, Wis., is considering the enlargement of his plant. The Schlegel washing machine is composed mainly of galvanized iron and copper. The Eagle Mfg. Co., of Appleton, has been manufacturing the castings and iron parts for furnaces and machines and Mr. Schlegel plans to manufacture these parts himself.

The Vilter Mfg. Co., Milwaukee, Wis., has been granted a permit by the building inspector of Milwaukee to erect a one-story factory building on Clinton street, between Becher street and Kinnickinnic avenue, to cost $27,000. It will be 124 x 274 feet, 34 feet high, of steel and brick construction. The new building will be used as an extension of the ice and refrigerating machinery department and for the preparation of tubing for this purpose.

The Lakeside Forge Co., Erie, Pa., which will take over the plant of the Lakeside Forge & Wrench Co., that city, advises that it will increase the output of the old plant by adding new equipment such as drop board hammers of medium sizes, and an engine and generator. Some die sinking machines will also probably be installed. Forged wrenches and drop forgings of all kinds will be manufactured. F. B. McBrier, Alexander Jarecke and Frederick A. Brevillier are the incorporators.

The Seberg Mining & Mfg. Co., Racine, Wis., the organization of which was recently noted in THE IRON TRADE REVIEW, is considering a proposition to establish its works at Kenosha, Wis. The Kenosha Commercial Association has offered a free factory site and other inducements. A. Gustav Seberg, inventor of the devices and designer of the machines to be manufactured, states that no decision has been made, but it is likely that the concern will hold to its original intention and locate at Racine.

Government News

These proposals were received and opened Oct. 24 by the bureau of supplies and accounts, navy department, for furnishing the materials and supplies, for delivery at the naval stations named:

Schedule 3946, class 1, Norfolk, 1 Gisholt turret lathe: Gisholt Machinery Co., Madison, Wis., $3,145; Manning, Maxwell & Moore, New York, $3,150; Niles-Bement-Pond Co., New York, $3,485.

Schedule 3966, class 11, Washington, 1 die-sinking machine No. 1: Manning, Maxwell & Moore, New York, $840; Pratt & Whitney, Hartford, Conn., $1,174.

Schedule 3967, class 21, Brooklyn, 1 anchor windlass, complete with engine, for U. S. S. New York: Newport News Ship Building & Dry Dock Co., Newport News, Va., $18,795; Williamson Bros. & Co., Philadelphia, $18,250.

Schedule 3968, class 22, Brooklyn, 1 steering gear, including engine, motor and hand gear, for U. S. S. New York: Hyde Windlass Co., Bath, Me., $33,280; Newport News Ship Building & Dry Dock Co., Newport News, Va., $32,076 and $32,376; Williamson Bros. & Co., Philadelphia, $28,275.

Schedule 3969, class 23, Brooklyn, 2 hoisting equipments for boat cranes, 166 horsepower, 120 volt motors, and 25 3-horsepower motors for ammunition hoists, for U. S. S. New York: General Electric Co., Schenectady, N. Y., $18,326; Newport News S. B. & D. D. Co., Newport News, Va., $18,040.

Schedule 3970, class 24, Charleston, 3 fuel-oil blacksmith forges: Mircs Fuel Oil Equipment Co., Norfolk, Va., $785.

Schedule 3982, class 41, Iona Island, N. Y., 1 lathe: Bradford Machine Tool Co., Cincinnati, informal; Frevert Machinery Co., New York, $668 and $718; The Fairbanks Co., Washington, $719; Garvin Machine Co., New York, $800 and $823; Manning, Maxwell & Moore, New York, $1,181, $717, $908, $895 and $699; Niles-Bement-Pond Co., $838, $716, $778; Prentice Tool & Supply Co., $1,049 and $1,124.

Schedule 3982, class 42, do., 1 pipe-threading machine and 4-horsepower motor: Frevert Machinery Co., New York, $664; Fairbanks Co., Washington, $689.20; Kemp Machinery Co., Baltimore, Md., $559.50 and $669.50; Manning, Maxwell & Moore, New York, $1,220, $699, $988, $1,734; Manhattan Supply Co., New York, $1,345; Niles-Bement-Pond Co., New York, $1,100; Vermilye & Power, New York, $451.25.

Schedule 3983, class 51, Brooklyn, 4 ash-hoisting engines, for U. S. S. New York. Lidgerwood Mfg. Co., New York, $603; Newport News S. B. & D. D. Co., Newport News, Va., $355; Williamson Bros. & Co., Philadelphia, $475.

Schedule 3984, class 52, Brooklyn, 2 50-kilowatt turbo generating sets: General Electric Co., Schenectady, N. Y., $8,650; Karr Turbine Co., Wellsville, N. Y., $2,263.90; Terry Steam Turbine Co., New York, $6,200; DeLaval Steam Turbine Co., Trenton, N. J., $2,815 and $3,375.

Class 73, do., 72 lathe and planer holders and miscellaneous O. K. tools: Montgomery & Co., New York, $1,149.12; Manning, Maxwell & Moore, New York, $1,195.86; Manhattan Supply Co., New York, $1,328.44; Vermilye & Power, New York, $1,323.30.

Clarke S. Smith, major, United States engineer office, Memphis, Tenn., will receive bids until Nov. 24 for a locomotive crane.

The bureau of supplies and accounts, navy department, Washington, D. C., opened bids under schedule 3995, on Oct. 24, as follows: General Electric Co., Schenectady, N. Y., $43,200; Newport News Ship Building & Dry Dock Co., Newport News, Va., $37,409. Five exhausters and 39 blowers, for the U. S. S. New York, were called for.

The isthmian canal commission opened bids, on Oct. 24, for furnishing plant and materials for a hydroelectric plant at Gatun, including: Class 1, item 1, three 2,250-kilowatt turbines; item 2, three governors; item 3, three headgates; item 4, three penstocks; item 5, three compressed air regulators, including piping; item 6, a lubricating system. Class 2, item 1, three 2,500-kilo-volt-ampere generators; item 2, three exciters of 50 kilowatts capacity; item 3, two motor driven exciter sets of 100 kilowatts capacity. Class 3, item 1, one 20-ton, three-motor, traveling crane; item 2, one 20-ton, three motor, traveling crane, for scheme 2 only. The bids were as follows:

Class 1—Pelton Water Wheel Co., New York (total excepting item 6), $92,850, delivery 90 to 195 days.

Receivers of Platt Iron Works Co., Dayton, O., total, $92,346, delivery 225 to 285 days; $91,028, delivery 165 to 225 days; $100,831 (omitting item 6) 165 to 225 days.

S. Morgan Smith Co., York, Pa., six propositions (not extended), the first of which totals $100,782. Time, not given.

Class 2 — General Electric Co., Schenectady, N. Y., seven bids, ranging from $42,067 to $49,906, delivery 140 to 200 days.

Westinghouse Electric & Mfg. Co., Washington, D. C., twelve bids ranging from $40,729 to $59,998.44, delivery 225 days.

Allis-Chalmers Co., Malwaukee, $81,520 and $80,920, delivery 220 to 280 days.

Class 3—Cleveland Crane & Engineering Co., Wickliffe, O., twelve bids, ranging from $4,420 to $4,810, delivery beginning March 1, complete April 1, 1912.

Niles-Bement-Pond Co., New York, twelve bids, ranging from $4,310 to $5,231, delivery 100 to 120 days.

Whiting Foundry Equipment Co., Harvey, Ill., twelve bids, ranging from $4,174 to $5,447, deliveries 96 to 112 days.

The bureau of supplies and accounts, navy department, has awarded contracts, for the delivery at the naval stations named, of the goods described, on which bids were opened as follows:

Opening Sept. 5.

Class 1, Mare Island, 1 shaping machine, Manning, Maxwell & Moore, $829.

Class 2, do., 1 drill press, Kemp Machinery Co., Baltimore, $502.14.

Opening Sept. 12.

Class 101, Brooklyn, 1 speed winch, Williamson Bros. & Co., Philadelphia, $6,175.

Opening Sept. 26.

Class 11, Washington, 1 trimming press, Toledo Machine & Tool Co., Toledo, O., $2,900.

Canal circular 661, under which bids will be opened Dec. 30, will describe spillway gates and machines.

The Aumen Machine & Supply Co., of Baltimore, have been awarded the contract for furnishing the District of Columbia with a 16-inch back-geared, motor-driven crank shaper, on its bid of $666.53.

(In order to assist the post office in delivering letters to new concerns, it is suggested that the names of incorporators be written in the lower left hand part of every envelope addressed to such new companies.)

New Buyers

The following manufacturing companies have filed articles of incorporation:

The United States Textile Machinery Co., Gardiner, Me.; $500,000; by president, M. E. Heleston.

The A. Stucki Co., Pittsburgh, Pa.; $5,000; to manufacture iron and steel; by treasurer, A. Stucki, Pittsburgh, Pa.

The Metallic Alloys Co., Bradford, Pa.; $10,000; to manufacture bearings; by treasurer, W. C. Leary, Bradford, Pa.

The United States Assay & Refining Co., St. Louis; $7,000; by George W. Mark, George B. Webster, Robert Hoffenkamp.

The Pneuvac Co., Boston; $100,000; to manufacture vacuum cleaners; by L. W. Brock, R. M. Merritt and O. J. Gleason.

The Stevenson Co., Pittsburgh; $6,000; to manufacture electrical machinery; by treasurer, Wm. D. Stevenson, 1221 Westinghouse building, Pittsburgh.

The Burke Machine Tool Co., Conneaut, O.; $20,000; by G. H. Burke, Floy Burke, A. P. Claude, Augusta Haller and Harry Rockwell.

The Pennsylvania Can Lock Co., Monessen, Pa.; $25,000; to manufacture cans and locks; by treasurer, Michael Heynik, Monessen, Pa.

The C. S. Clark Mfg. Co., Elgin, Ill.; $25,000; to manufacture farm implements; by C. L. Clark, Samuel Peterson, A. W. Anderson.

The Carbon Steel Co., Pittsburgh; $5,000; to manufacture iron and steel; by treasurer, Fred C. Shobert, Oliver building, Pittsburgh, Pa.

The Boenker Motor Plow Mfg. Co., St. Charles, Mo.; $24,000; to manufacture motor plows; by H. H. Boenker, Louis Ringe and J. C. Wilbrand.

The Gawenda-Marko Mfg. Co., West Berwick, Pa.; $5,000; to manufacture machinery of all kinds; by treasurer, John Marshay, West Berwick, Pa.

The Large Motor Truck Co., Pittsburgh; $25,000; to manufacture self-propelled vehicles; by treasurer, Edwin L. Atkinson, 923 Mellon street, Pittsburgh.

The Case Crane Co., Pittsburgh; $5,000; to manufacture iron, steel and cranes; by treasurer, Chas. P. Carpenter, Sixteenth and Wood streets, Pittsburgh.

The National Metallic Bed Co., Everett, Mass.; $20,000; to manufacture beds; by Herman Rosenthal and Frank A. Yanes, Chelsea, Mass., and John W. Wilkes, Brookline, Mass.

The Meriden Press & Drop Co., Meriden, Conn.; $50,000; to manufacture presses; by Herman Hess, Henry M. Doolittle, C. H. Doolittle and Raymond P. Hess.

The Rib Grip Co., Hartford, Conn.; $100,000; to manufacture and deal in metal novelties; by Robert H. Lewis, Alvan Waldo Hyde and John S. Fitzsimmons, all of Hartford.

The Richmond Engineering & Mfg. Corporation, Richmond, Va.; $100,000; by president, John Landstreet; general manager, H. S. Grigsby, and secretary and treasurer, John S. Harrison.

The Capital Gas Engine Co., Sacramento, Cal.; $100,000; to manufacture gas engines; by directors, James Shaw, F. F. Thomson, C. H. Hardy, A. F. Harrison and W. A. Mackinder.

The Spring Hub Automobile Wheel Co., Cincinnati; $10,000; by James G. Blackburn, John H. Kruse, Harry H. Weild, James F. Earle, Henry W. Plump, Robert Freisens and Edgar M. Woolley.

The National Pin Co., Derby, Conn.; $200,000; to make and deal in pins, hooks and eyes, etc.; by Edward A. Harriman and S. Bigelow Cheney, both of New Haven, and Harold A. Drew, of Ansonia, Conn.

The American Mfg. Co., Providence, R. I.; $10,000; to buy and sell and manufacture all kinds of machinery; by W. L. Frost and H. B. Frost, of Providence, and I. R. Morns, of Auburn, R. I.

The Western Screw Products Co., St. Louis; $3,000; to manufacture milled screws and screw machine products; by president, John T. Soy; vice president, J. I. Moeller; secretary and treasurer, Joseph J. Hagen.

The New England Collapsible Tube Co., New London, Conn.; $40,000; to manufacture and deal in tubes for toilet products, etc.; by L. Tracy Sheffield, W. Kyle Sheffield and Nathan Belcher, all of New London.

The Century Gas & Electric Fixture Co., Bridgeport, Conn.; $10,000; to manufacture and deal in gas and electric fixtures, etc.; by George Stiff, Harry C. Norrish, William Stiff and Robert C. Mallette, all of Bridgeport.

The Atlanta Mfg. Co., Atlanta, Ga.; $100,000; to manufacture oil-mill, fertilizer-factory, cement, milling, cotton-mill and general mill machinery and electric conveying supplies; by Joseph O. Bailey, A. B. Kennedy and J. E. Boston.

General Industrial

The American Foundry Co., of Leipsic, O., has changed its name to the Temco Electric Motor Co.

The Southern Stamping & Mfg. Co., Nashville, Tenn., which recently increased its capital stock from $10,000 to $25,000, advises that it will not make any additions to its plant or need any new equipment at the present time.

The Lawrence Automatic Brake Co., Kansas City, Mo., will manufacture various kinds of vehicle brakes for wagons, carts, cabs, hearses, etc., all of which will be automatic and which will be operated by the horse or team without any action of the driver.

Trade Notes

The International Oxygen Co. announces the removal of its New York office to 115 Broadway.

The Molle Typewriter Co., organized by J. E. Molle, of Antigo, Wis., inventor and patentee of a new typewriting machine, will probably locate its works at Wausau, Wis.

The Standard Steel Co., Bedford, O., has opened a suite of offices at 262 Rockefeller building, Cleveland, in charge of C. R. Williams, president of the company.

Fires

Fire recently damaged the Eureka Foundry Co.'s plant at Chattanooga, Tenn., to the extent of $20,000.

The machine shop of Hathaway Bros., of Corvallis, Ore., was partially destroyed by fire recently, the loss being about $5,000. Most of the machinery was destroyed or damaged, and this will be replaced or repaired at once.